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CONTACT DERMATITIS FROM WEEDS: PATCH TESTING WITH THEIR OLEORESINS

CHAIRMAN'S ADDRESS

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When the term contact dermatitis of plant origin is employed, one immediately thinks of poison ivy and pictures an acute dermatitis venenata of sudden occurrence with marked swelling and vesiculation of the affected areas. This impression of plant dermatitis is due to the high incidence of acute dermatitis venenata occasioned by contact with the poison ivy vine or shrub, this plant being a violent skin irritant for a high percentage of those who touch its leaves or indirectly come in contact with some object contaminated with its sap. The few persons who are mildly sensitive to poison ivy react with only an erythematous eruption following such exposure. Occasional instances of a chronic type of dermatitis have been observed in such persons following frequently repeated contact with this plant.

Acute dermatitis occasionally follows contact with weeds, but the usual clinical picture is that of a chronic dermatitis. Sensitivity is usually moderate, and frequently repeated exposures over a long period of time result in a seasonal dermatitis persisting during the growing season of plants.

The average person with weed eczema gives a fairly characteristic history. The eruption usually begins in the spring or early summer and continues until the first killing frost or freeze. During the first few years the dermatitis is seasonal, corresponding closely to the growing season of plants. At the onset the eruption is usually erythematous, scaling and pruritic. Frequent exacerbations, caused by massive exposures, are characterized by an increase in the erythema, swelling and oozing and occasionally by fine vesiculation. With each seasonal recurrence the dermatitis becomes more widespread, owing to a gradual increase in sensitivity and the manual spread of the antigenic oleoresins to areas of the body covered by clothing. Thickening of the affected areas follows the trauma occasioned by protracted scratching and rubbing. Seasonal attacks extend further into the winter before completely healing. Sooner or later the eruption becomes perennial—extremely severe during the growing season of plants with remissions during the winter months. Erythema, edema, oozing and crusting disappear, but pruritic, lichenified areas often persist until the new spring weeds return.

The sites affected are usually the exposed areas such as the face, neck, backs of the hands, wrists and ankles. The eruption gradually spreads to involve the forearms and legs. In men the penis and the anterior surface of the scrotum are often erythematous and thickened. Occasionally patchy areas of dermatitis appear over the trunk and groins. In the more widespread and long standing cases, those areas which are more easily irritated by external agents, such as the face, the sides and front of the neck and the flexures, become markedly lichenified.

Prolonged healing time is characteristic. If patients with weed eczema are hospitalized and contact with vegetation is absolutely avoided, disappearance of the eruption usually occurs within three to six weeks. If these patients are ambulatory but avoid actual contact with weeds, the healing time is frequently prolonged for from six weeks to several months, since they continue to come in contact with small amounts of the antigenic oleoresins through such intermediary objects as contaminated work clothes, tools, pets, udders and bellies of cows in milking and work stock.

Most of the affected persons have been farmers and farmwives, workers in oil fields and others whose occupations bring them into almost daily contact with vegetation.

THE ETIOLOGY OF WEED DERMATITIS

Each weed contains an ether soluble oleoresinous dermatitis producing fraction and a water soluble albuminous hay fever producing fraction. This can be readily demonstrated by tests on a person in whom a dermatitis develops from contact with a specific weed and hay fever or asthma from inhaling its pollen. Patch tests on this person with portions of the antigenic plant will evoke a delayed eczematous reaction. If all the dermatitis producing oleoresin is removed by repeated ether extraction, the remaining de-oiled portion of the plant will not give a positive patch reaction. A water extract of this de-oiled residue, which still contains the atopic fraction, will then evoke the typical immediate urticarial scratch or intradermal hay fever reaction.

The eczema producing oleoresins appear on the leaves, stems and flowers of many weeds as tiny globules of oil, readily seen with a hand lens. These oleoresins are very sticky and adhere tenaciously to the skin or clothing. Contact of sensitized persons directly with the plant or with contaminated intermediary objects is followed by dermatitis. Some plants, such as poison ivy, do not contain resin ducts in the epidermis of their leaves and must be bruised for a person to come in contact with their antigenic oils.

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Owing to lack of space, this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the author's reprints.

Read before the Section on Dermatology and Syphilology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

Previous contact is necessary for the development of sensitization to a plant. Heinbecker [1] examined by patch test sixty-five Baffin Island Eskimos with a concentrated extract of poison ivy. All test sites remained normal. Poison ivy does not grow north of the mouth of the St. Lawrence River. Straus,[2] applying similar tests, found newborn infants nonsensitive to this plant. I made patch tests of twenty-eight newborn infants confined in a foundling home. Not a single positive patch test developed during thirty days' observation. Approximately 50 per cent of young adults in the vicinity of Dallas, Texas, are sensitive to poison ivy, a plant with a high exposure index in this locality. Five per cent of all adults are said to be sensitive to the primrose plant (Primula obconica). Patch tests with an extract of this plant on 251 medical students, with no history of previous exposure, did not reveal a single positive patch test. Similar tests on twenty-five Dallas florists, who frequently handle this species of primrose, gave two positive reactions (8 per cent).

CLINICAL AND SUBCLINICAL SENSITIZATION

In the routine testing of persons with portions of the poison ivy plant I have repeatedly encountered test subjects who gave a mild to a moderate reaction at the site of the patch test but who did not develop ivy dermatitis following the ordinary clinical exposure of handling or walking through ivy vines. The greatest number of these reactions were observed when patch tests were done for a twenty-four hour period with the fresh ivy leaf or the dry plant meal.

Many of these subclinically sensitive persons were taken on field trips into ivy infested areas where they repeatedly handled the plant, walked through the trailing ivy vines, aided in the collection of ivy pollen, pinned ivy leaves to their clothing and the like, yet a subsequent dermatitis did not develop unless the bruised leaf was rubbed on their skin.

I have observed many instances of subclinical sensitivity to weeds. These persons give a mildly positive patch reaction to the antigenic weed and develop a subsequent dermatitis after massive exposure but do not develop a dermatitis following the ordinary clinical exposure of touching the offending herb.

PROCEDURE FOR EXTRACTING PLANT OLEORESINS

Mature green plants are collected, placed on paper and dried in a dark room to preserve the chlorophyll, which is useful as a coloring agent to delineate the patch site. After thorough drying, the plants are ground fine in order to extract the maximum amount of oil. The ground plant is packed loosely to within an inch of the top of a pint jar and covered with ether. The jar is sealed to prevent evaporation. The ether covered plant meal should stand for a minimum of twenty-four hours. The ether containing the dissolved plant resin is filtered and then placed in an open vessel to allow evaporation. The residue is a very sticky, viscid substance varying in color according to plant species from a very dark green to greenish brown or black. Dilutions are made by dissolving the crude resin in some fat solvent such as alcohol, ether or acetone. Dilutions are made by volume and not by weight. The 1:10 dilution, for example, is made by adding one part of the crude resin to nine parts of a solvent.

1. Heinbecker, P.: The Susceptibility of Eskimos to an Extract from Toxicodendron Radicans, J. Immunol. 15: 365 (July) 1928.
2. Straus, H. W.: Artificial Sensitization of Infants to Poison Ivy, J. Allergy 2: 137 (March) 1931.

SITE CHOSEN FOR PATCH TESTING WITH OLEORESINS

In a patient of given sensitivity the cutaneous response to a patch test with a specific excitant is governed almost entirely by the thickness of the skin of the area tested. The simultaneous patch testing of various areas of skin shows that the most marked reactions are obtained at sites where the skin is thin, as in the cubital and popliteal fossae and the anterior portion of the neck. Tests on the skin of the thigh, arm, abdomen, chest and back give almost identical reactions but are of less severity than those encountered in the flexures. Reactions are markedly diminished or even entirely absent over the volar surface of the wrists, elbows and knees and the flexor surface of the ankles when these areas are thickened. In persons extremely sensitive to poison ivy I have never succeeded in obtaining a positive patch test on the palms or soles with the leaf, the plant meal or the 1:10 dilution of the oleoresin. After proper drying, the dorsa of the tongues and the palates of sixteen ivy sensitive patients were painted with the 1:10 dilution of the poison ivy oleoresin. Two persons gave a slightly positive reaction on the tongue; erythema and fine vesiculation of the palate developed in all. Reactions were reduced, since saliva acts as a diluent and also lessens adhesion of the oleoresin to the mucous membrane.

Since extracts of poison ivy and many other plants placed simultaneously on the arms, thighs and backs of clinically and subclinically sensitive persons produced approximately the same cutaneous response, the back was the site chosen for patch testing with plant resins.

METHOD OF APPLYING OLEORESINS

Dilutions of plant oleoresins in ether or acetone are placed in 4 cc. cork stoppered vials. Applications are made with the moistened end of the cork. The ether or acetone evaporates immediately, leaving a small quantity of chlorophyll stained crude resin in contact with the skin. Patch tests are placed on the back in vertical rows of ten, three rows on each side of the spinal column. The patch sites are not covered. Patients are warned not to scratch reacting areas, as small amounts of antigenic oleoresins may be transferred manually to other areas. Lines drawn between the vertical and horizontal rows of tests with an indelible pencil divide the back into small squares and aid in identifying patch sites. Sixty tests can be applied in approximately five minutes.

WEEDS EMPLOYED IN ROUTINE TESTING OF THE SKIN

During a period of six years, field trips have been made through Texas to ascertain which weeds individuals are most likely to come in contact with in work or play. Plants were chosen because of their distribution and abundance. Those with a high exposure index have been employed in routine testing of the skin until it has been definitely proved that they have a very low sensitizing index. Such weeds were then discarded and others substituted. It is a well known fact that any weed may cause a dermatitis in a sensitized person. The purpose of this study was not to discover every weed that might cause an occasional eruption but to find the major and minor skin sensitizing weeds just as allergists have determined the major and minor hay fever and asthma producing plants. The oleoresin of poison ivy has been used as a control in all our experiments. In the accompanying tabulation the reactions of

only fifty-six weeds are recorded, since four or more tests on each subject have been done with miscellaneous oleoresins.

CONTROL TESTS

Skin Testing with Fresh Tissue Juices or Sap.—Before patch testing a large number of persons with the ether extracted plant oleoresins, it was deemed necessary to study the action of the fresh juices of these plants on normal persons.

If a drop of the milky juice of the mature poison ivy plant (Rhus toxicodendron radicans) is placed on the skin of a nonsensitive volunteer, this area immediately turns white as if painted with trichloroacetic acid. After a short period the area turns black because of the oxidation of the ivy juice. An eschar forms. This sloughs off in from eight to ten days. Complete healing with scar formation requires about two weeks. This juice has the same caustic effect for the skin of all animals tested—rabbits, guinea pigs and goats. When rabbits and guinea pigs were fed a meal consisting exclusively of fresh poison ivy leaves a crusting, irritative dermatitis of the lips developed. Immunity of man to poison ivy is relative. All degrees of dermatitis, from erythema to typical vesiculation, will develop on persons who have been proved clinically and subclinically nonsensitive to ivy after a latent period of from twelve to twenty-four hours if the amount of ivy sap applied to the skin is properly varied.

The milky juice of snow-on-the-mountain (Euphorbia marginata) has long been known to be irritating to both man and animal. When the juice of this plant is placed on the skin of a clinically nonsensitive person the area becomes erythematous almost immediately and there is a slight sensation of stinging at the contacted site. The erythema disappears rapidly but is followed after a latent period by a constant follicular papulopustular irritative reaction. The fresh tissue juices of the remaining weeds of this series (as shown in the tabulation) are not primary cutaneous irritants.

Skin Testing with Fresh Plant Leaves.—When clinically and subclinically nonsensitive persons submitted to patch tests with bruised fresh leaves of the weeds of this series, a large number of irritative reactions were encountered. During the early work with plants, the erythema and edema produced at sites patch tested for twenty-four hours with a plant leaf caused me erroneously to consider several persons plant sensitive. Subsequent tests showed absolute lack of both clinical and subclinical sensitivity. A twenty-four hour covered patch test with a fresh leaf, plant meal or ether extracted oleoresin is not an accurate test, since exposure to a plant is never continuous for twenty-four hours. It has been proved on numerous occasions that a patch test with the bruised plant leaf for a contact period of one hour or less will always occasion a positive patch reaction in both clinically and subclinically sensitive persons. Irritative reactions are not encountered in tests of such short duration.

Skin Testing with the Finely Ground Whole Plant.—The weeds of this series have been dried and ground to the consistency of meal. These plant meals have been found nonirritative to the skin of nonsensitive persons on twenty-four hour covered patch tests. Similar tests of such duration on weed sensitive persons provoke an abnormal number of positive reactions—reveal sensitizations that are of no clinical importance. When properly stored, plant meals retain their antigenic properties for at least four years.

Skin Testing with Water Extracts of Weeds.—Many weed sensitive persons volunteered the information that the plants to which they were sensitive "poisoned them more" if touched when wet with dew or rain. For this reason fresh water extracts of all the weeds in this series were tested on apparently normal persons. No positive patch reactions were observed. The water solubility of the dermatitis producing fraction (oleoresin?) of all weeds in the series could not be clinically determined since many did not prove antigenic for a single person. Of the weeds proved antigenic, the oleoresin of narrow leaved marsh elder was found rather markedly soluble in water as evidenced by the production of frankly positive patch tests when fresh water extracts of this plant were employed for testing sensitive persons. The oleoresin of such plants as dwarf ragweed, sneezeweed, parthenium, ironweed and gaillardia are moderately water soluble. The oleoresin of some plants, such as poison ivy, is absolutely insoluble in water. Water extracts deteriorate rapidly and lose their antigenic properties in one month or less.

Control Tests with the 1:1 Dilution of Weed Oleoresins.—Thirty-three apparently normal persons submitted to patch tests with the 1:1 dilution of all the oleoresins in this series except poison ivy. Five positive reactions were obtained in 1,815 (33×55) patch tests. These were considered irritative reactions since repeat tests with the 1:10 dilution of the same oleoresins gave completely negative reactions.

Control Tests with the 1:5 Dilution of Weed Oleoresins.—Forty-four apparently normal persons were tested with the 1:5 dilution of all oleoresins except poison ivy. Four moderately positive reactions were noted in 2,420 patch tests (44×55). When retests were made with the 1:10 dilution of the oleoresin, one very mildly positive reaction resulted. I believe that the latter reaction indicated subclinical sensitivity. Further tests were then done to determine the dilution of the extract which would indicate clinical and subclinical sensitivity without provoking irritative reactions.

Control Tests with 1:10 Dilution of the Oleoresins.—One hundred apparently normal medical students submitted to patch tests with the 1:10 dilution of all the plant oils. Fifty-two positive reactions were noted at sites tested with the ivy extract. The remaining patch areas were completely negative (5,600 tests).

Fifty proved cases of poison ivy dermatitis tested with all fifty-six oleoresins showed frank vesiculation at the sites of the poison ivy tests but negative reactions at the remaining patch areas (2,800 tests).

Thirty-seven persons with pollen hay fever or asthma but with no history of dermatitis were tested with the 1:10 dilution of all oleoresins except that of poison ivy. Not a single positive reaction occurred at any of the 2,035 test sites (55×37).

Fifty-seven persons with proved contact dermatitis from other excitants, such as cosmetics, crude oil and chemicals, submitted to patch tests with all the oleoresins except that of poison ivy. One showed mildly positive reactions to fleabane, camphor daisy and prairie Froelichia on the initial test and on three retests with both the 1:10 and the 1:20 dilution of the specific oleoresins. This person was considered subclinically sensitive to these three plants. The remaining fifty-six persons gave negative reactions at all patch sites (3,135 tests).

One hundred and eighty-seven persons with miscellaneous dermatoses such as drug eruptions, postarsphenamine dermatitis, bacterial allergies, urticarias and

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eczemas of undetermined cause were similarly tested. Four mildly positive reactions were observed in 10,285 tests (187 × 55). I considered these reactions examples of subclinical sensitivity.

In the routine testing of persons clinically and subclinically sensitive to poison ivy with the 1:10 dilution of the oleoresin I have never failed to obtain a frankly positive patch reaction. Conversely, I have never encountered a positive reaction with this dilution when testing persons proved nonsensitive. Since the 1:10 dilution of the crude plant extract does not act as an irritant yet never fails to evoke reactions in both clinically and subclinically sensitive persons, this was the dilution chosen for routine patch testing.

TRANSEPIDERMAL ABSORPTION OF PLANT OLEORESINS

When weed sensitive persons were tested on unbroken areas of skin by the uncovered method, many developed an apparent flare-up of the eruption. Focal flare-ups did not occur when the same persons were retested and the patch sites were completely covered to prevent manual transference of the oleoresin. Three patients who submitted to patch tests with the specific oleoresin on excoriated areas developed not only a focal flare-up of the eruption (vascular type reaction) but also an ephemeral maculopapular urticarial type of reaction over unaffected areas of the trunk. In addition, one of these subjects presented a vesicular "id" eruption of the palms and soles.

I have repeatedly encountered focal flare-ups of the eruption and generalized urticaria during co-seasonal attempted hyposensitization therapy when the specific oleoresin was given orally or intramuscularly.

FLARE-UP OF HEALED PATCH SITES

Focal flare-ups observed in weed sensitive persons who were tested on areas of unbroken skin by the uncovered method can be explained only by the transference of minute quantities of the specific oleoresins manually from pruritic reacting sites on the back to distant areas. These small amounts of oleoresin caused a definite flare-up of the supersensitized areas of healing or recently healed dermatitis but were not of sufficient strength to evoke a dermatitis on the normally sensitized unaffected skin.

In an effort to determine the duration of supersensitization of areas of previous dermatitis, weed sensitive persons were patch tested with serial dilutions of the specific oleoresin in corn oil. Those dilutions which evoked positive patch reactions on previously unaffected areas of skin were termed reactive concentrations of the oleoresin. Dilutions too weak to evoke such a positive response were termed subreactive concentrations. By painting the patch areas and the surrounding skin with subreactive concentrations of the specific oleoresins I have repeatedly been able to bring about a flare-up of patch sites completely healed for months. In one ivy sensitive person I was able to bring about a flare-up of a patch site healed for one year.

I am convinced that sensitization to an external agent is always general, the skin and mucous membrane alike being involved. The difference in sensitization of different areas of both skin and mucous membrane (mouth only site tested) is relative. True local sensitivity to an external agent does not occur.

Healing and completely healed patch sites are often metallergic in that they can be caused to flare up by the application of nonspecific plant oleoresins, adhesive tape and the like. An oleoresin which evokes only a very mildly positive reaction on a previously unaffected area will frequently cause a frankly positive reaction if applied to a recently healed patch site which was originally evoked by a totally different plant extract. Patch sites are parallergic in that an urticarial flare-up of healing and recently healed areas often follows positive Dick, Schick and tuberculin reactions. Healing and recently healed patch sites are frequently rather markedly dermographic, rubbing causing an urticarial flare accompanied by intense pruritus of the site (release of H-like substance?). This may account for the paroxysms of itching in many eczemas—especially the infantile type in which hospitalization and restraint are followed by a rapid amelioration of symptoms.

When a dermatitis is present, even though caused by positive patch tests, general sensitivity to other weeds is increased. At such times, patch tests on unaffected skin will result in frankly positive reactions to weeds that previously evoked doubtful or very mildly positive reactions. This increased general sensitivity disappears rapidly after healing of the original dermatitis.

ADHERENCE OF PLANT OLEORESINS TO SKIN OR COMBINATION OF ANTIGEN WITH FIXED CELL ANTIBODIES

It is generally believed that if clinical exposure to poison ivy is followed within a few hours by thorough washing with soap and water or sponging with tincture of ferric chloride or solution of potassium permanganate, the subsequent ivy dermatitis will be entirely prevented or markedly lessened. Believing this empiricism, I carried out experiments to determine just how soon it was necessary to use these prophylactic measures to prevent dermatitis. A leaf of poison ivy was gently rubbed on the forearms and a 1:10 dilution of the ivy oleoresin was painted on the upper arms of ivy sensitive persons. Four hours later these areas were thoroughly washed with soap and water. Frankly vesicular reactions followed. The contact time with the leaf and the 1:10 oleoresin was then shortened by hours, then by half hours, quarter hours and finally minutes. We had evidently started at the wrong end of the experiment. A contact period of one minute or less followed by thorough washing with soap and water for five minutes, with frequent interval spongings with ether, alcohol and carbon tetrachloride, was invariably followed by a dermatitis. With this extreme washing the reaction was frequently of less severity and the latent interval usually somewhat prolonged.

Similar tests carried out with tincture of ferric chloride and 10 per cent solution of potassium permanganate clearly demonstrated the fact that these agents are less effective than cleansing with soap and water. Ten per cent poison ivy extract, with tincture of ferric chloride as a diluent, retained its antigenic properties for several days.

An ordinary clinical exposure to ivy by a sensitive person was followed within five minutes by thorough washing of the involved area with laundry soap and water for ten minutes. Forty-eight hours later a typical vesicular ivy dermatitis in streaks and patches developed on areas touched by the ivy plant.

In weed sensitive persons, in whom sensitization is usually not so extreme, thorough washing usually prevents a positive patch reaction if the antigenic oil is left in contact with the skin for less than five or ten minutes.

PHOTOSENSITIZATION

Such plants as meadow grass, fig, bergamot and gas plant are known to be photosensitizers. Since plant oleoresins are applied to the back in routine testing and are thereby exposed to diffused daylight during the application and drying time, photochemical action of the weeds included in our list was considered. When any weed oleoresin produced a positive reaction, the test was immediately repeated and the test site covered to exclude all light. As positive reactions occurred before removal of the covering material, photodynamic action of the plant was eliminated. By the same patch method it was proved that the chlorophyll contained in all our plant oleoresins played no part in causing positive reactions.

Animals with white skins, such as certain horses, cattle and hogs, are known to develop a dermatitis after the ingestion of various weeds and subsequent exposure to the sun. No evidence of photosensitization has been observed in some twenty-five weed sensitive patients given the specific weed oleoresins intramuscularly or orally over a period of months in attempted preseasonal desensitization.

INDUCED SENSITIZATION FROM REPEATED PATCH TESTING

Eleven volunteers previously proved, by patch testing, nonsensitive to poison ivy were tested daily for six weeks with the 1:10 dilution of ivy extract. Fourteen persons proved nonsensitive to the weeds of this series submitted similarly to patch tests every day to every third day for a period of two months with extracts of the seven most sensitizing weeds of this series (see tabulation). No evidence of induced sensitization was observed in any of these volunteers. Twenty-eight newborn babies were tested with the 1:10 ivy extract and retests were done twenty-three days later. No positive reactions were observed following either testing.

Many weed sensitive persons who have completely avoided natural contact with weeds for a period of months or years have repeatedly been retested with the 1:10 dilutions of plant extracts. Induced sensitization did not follow these repeated patch tests. I believe that testing with the 1:10 dilution of a plant extract constitutes no greater exposure than the patient experiences daily in his routine work.

Individuals vary greatly as to their susceptibility to artificial sensitization. Employing a 1:10 or higher concentration of poison ivy extract for the sensitizing material, my associates and I have easily sensitized many persons to this plant. Induced sensitization has occurred in others only after prolonged application of the extract. Some persons seem completely refractory to sensitization, regardless of the concentration of the extract employed or the length of time it is left in apposition with the skin.

The sensitizing power of plants likewise varies markedly. Although we have readily sensitized persons to poison ivy, to date we have no record of induced sensitization to any other plant of this series.

Many weed sensitive patients who gave a mild delayed reaction to a specific oleoresin submitted to patch tests once or twice weekly with this plant oil for a period of from weeks to months. In some individuals it was possible to increase definitely their sensitivity to these oleoresins by repeated patch testing. This was evidenced by a shortening of the latent period between the application of the test and the cutaneous response and by an increase in the severity of patch reactions. In other individuals it has been impossible to increase the sensitivity by repeated patch testing with the specific excitant.

DELAYED PATCH REACTIONS

In the patch testing of persons of unknown sensitivity, a reaction delayed longer than seven days is empirically considered evidence of a single patch test serving as both the sensitizing and the activating application of the excitant. The interval between the application of the test and the appearance of the cutaneous reaction is considered the period of incubation of sensitivity.

During the testing of persons known to have suffered an ivy dermatitis years previously, I have seen patch reactions delayed until the tenth or eleventh day. Such delayed reactions must be considered as patch reactions delayed beyond seven days, or examples of a natural loss of sensitization with resensitization from a single application of the patch.

During the testing of persons of unknown sensitivity with the 1:10 dilution of ivy extract we have repeatedly seen positive reactions appear first between the seventh and the twenty-third day after testing. Fourteen such persons were immediately retested with the 1:10 or higher dilution of the ivy oleoresin. In twelve of these cases the latent period of subsequent reactions was always seven days or less. One patient regularly gave a positive reaction on the fifth or sixth day when tested with the 1:10 dilution, but positive reactions were delayed until the eighth, eleventh and seventh day respectively when three retests were done with the 1:20 or higher dilution. The last member of the group gave a positive reaction on the fifteenth day following the first patch test. A second patch applied one week later did not become positive until the eleventh day. During the routine patch testing of markedly sensitive persons with high dilutions of the specific oleoresins (1:1,000 to 1:1,000,000) I have repeatedly seen reactions to patch tests delayed to the seventh or eighth day following testing. Tests delayed to the twelfth day have been recorded by patients but not observed by us. From these experiments it appears that a patch reaction may be delayed beyond the empirical seven day limit of latency.

DERMATITIS FROM INTERMEDIARY CONTACT

During the past six years an attempt has been made to trace the source of ivy dermatitis when direct exposure to the plant was denied by the patient. It has been proved that dermatitis often follows contact with such ivy contaminated intermediary objects as shoes, clothing, heads of golf clubs, work tools, door knobs, steering wheels of automobiles, pets, and hands of other persons who had touched poison ivy. I have repeatedly gathered poison ivy, thoroughly washed my hands with soap and water and then at intervals rubbed the skin of ivy sensitive persons. The hands retained, up to six hours, sufficient oleoresin to evoke a dermatitis.

In tracing the source of recurrences in weed eczemas, positive patch tests have been obtained from hat bands, hay, unginned cotton, and scrapings from boots and shoes. These articles were antigenic for other weed sensitive persons but not for control subjects. Seven cases of so-called milkers' eczema have been proved by properly controlled patch testing to be due to weed oleoresins on the bellies and udders of cows and not to cow hair itself. Sheets are frequently contaminated by work clothes during a midday rest.

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CONTACT RHINITIS

Three persons with contact dermatitis from weeds complained of a crusting rhinitis during the pollinating season of the plants to which they were sensitive. One of these patients was retested during the interseasonal period of the dermatitis. When the mucous membrane of the nares was painted with a 1 : 1,000 dilution of the specific narrow leaved marsh elder oleoresin, a vesiculation followed after twelve hours. One drop of 1 : 50 dilution of the extract placed on the tongue was followed by redness and slight swelling after a similar latent period. Narrow leaved marsh elder, a plant which produces a large amount of pollen, covered this patient's farm and grew almost to her doorstep.

POLLENS LESS ANTIGENIC THAN REMAINDER OF PLANT

It has been stated that the anthers of many species of the sumac family contain no resin ducts. Their pollen therefore could not contain the antigenic oleoresins.[3]

I collected enough uncontaminated pollen of Rhus toxicodendron radicans to test eight ivy sensitive persons repeatedly. All patch tests with this pollen and its anthers gave entirely negative results.

The pollens of many weeds in this series seem much less antigenic than other portions of the plant. This antigenic variation between the plant and its pollen can best be gaged on moderately sensitive persons. Patch tests on such patients with the fresh leaf, meal or extract will reveal a moderately positive test, while the pollen will frequently give a frankly negative reaction. One Gm. of the specific antigenic pollen blown directly on the moistened faces of weed sensitive persons from a distance of 18 inches failed to cause a dermatitis.

Observation of weed dermatitis indicates that pollens play a minor role in the causation of this condition. Eruptions may be exaggerated during pollen storms or when the individual closely approaches pollinating weeds on windy days. I believe that the apparent increase in severity of a dermatitis during the pollinating season is due to a greater oleoresin content of weeds at that time.

PASSIVE TRANSFER EXPERIMENTS

All attempts to demonstrate antibodies in blood serums of weed sensitive persons by the Prausnitz-Küstner method of passive transfer have failed. Blister fluid of weed sensitive patients injected intradermally into control subjects did not sensitize the injected sites. Blister fluid incubated with the specific oleoresin for twenty-four hours did not give a positive patch reaction on nonsensitized persons. With the aid of Dr. J. H. Black, 1 square centimeter or more of skin was excised from each of five plant sensitive patients, ground with sand and saline solution, passed through a Seitz filter and injected intradermally or tattooed into the skin of nonsensitive controls. The injected sites were then patch tested with the 1 : 10 dilution of the specific oleoresin. Three such tested sites were entirely negative. Mottled erythema developed at two test sites on the third and fifth days respectively.

SUMMARY

Contact dermatitis from weeds may be acute but is usually chronic, persisting for many years during the growing period of plants. The exposed areas are chiefly affected and healing time after avoidance of contact with the offending plant is prolonged. Sensitization to plants is apparently general, both skin and mucous membrane being involved. Sensitization may be either clinical or subclinical. Patch testing with plants may be greatly facilitated by employing their ether extracts for testing material.

1719 Pacific Avenue.

3. McNair, J. B.: Rhus Dermatitis: Its Pathology and Chemotherapy, Chicago, University of Chicago Press, 1923.

THE PATHOGENESIS OF CRISIS AND DEATH IN HYPERTHYROIDISM

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The physiology of the thyroid gland is probably as well understood as that of any organ of the body, yet there is much that is not clear with regard to the many pathologic states which result in disordered function of this organ. There has been difficulty, particularly in understanding that curious state referred to as thyroid crisis, a condition often terminating in death either prior to or, frequently, after operation, the pathogenesis of which is rarely made clearer by postmortem examination. In this state it is obvious there are profound toxemia and a violent and overwhelming disturbance of metabolic processes with, no doubt, a profoundly altered blood chemistry if, as remarked by Maddock,[1] "one only knew what to measure."

Twenty years ago it was not uncommon for patients to be admitted to the hospital in active crisis and to succumb rapidly in spite of treatment. As patients and physicians have increasingly realized that much can be done for hyperthyroidism, such situations have become less common, but, while the incidence of postoperative crisis has fallen to an apparently irreducible minimum, the condition yet occurs even in the best of clinics and after most careful preoperative preparation and most meticulous planning of operative procedures as a harrowing and frequently fatal complication. When crisis, under these circumstances, does develop it usually appears unexpectedly, the point being frequently made that, when death does occur, the surgeon, had he exercised greater foresight, could have prevented it. Yet patients who seem to present the most serious risks frequently go through an extensive thyroidectomy without reaction, while others who may seem to be in far better condition rapidly succumb, usually within forty-eight hours, to that curious and yet unexplained condition referred to as postoperative hyperthyroid crisis. Semiconsciousness, extreme restlessness, uncontrollable even after heavy sedation and accompanied by an uncountable pulse, frequently cyanosis, delirium and finally death compose the picture. No one has as yet determined the basal metabolic rates under these circumstances. Nothing but a spurious result could possibly be obtained because of the patient's extreme restlessness. In all probability, the oxygen consumption and heat production become far greater than in any other disease known.

From the Departments of Surgery and Pathology of the George F. Geisinger Memorial Hospital.
Read before the Section on Surgery, General and Abdominal, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 19, 1939.

1. Maddock, W. G.; Pedersen, Svend, and Culler, F. A.: Studies of Blood Chemistry in Thyroid Crisis, J. A. M. A. 109:2130-2135 (Dec. 25) 1937.

What to do for the patient once the condition has presented itself or, more important, how to prevent its occurrence are questions of the greatest importance in the surgical treatment of toxic goiter.

It is logical to believe that, given two large groups of patients from widely separated clinics where the surgical experience has been extensive and the surgeons have given sedulous and long continued study to the problems of thyroid disease and are of equal skill, there may be a difference in mortality attributable to factors entirely related to the patients, to the habitual delay in accepting treatment or to the patients' or physicians' neglect in accepting adequate surgical care for known toxic goiter. Statistics from large clinics will show that with an increase in the number of patients with any particular disease the relative mortality is constantly decreased owing, to a certain extent, to numerical factors alone. The surgical center drawing patients from far flung rural areas is faced with the problem of handling advanced disease, in whatever area of the body it may be located, to a far greater degree, we believe, than is the urban clinic, whose patients are far more inclined to accept surgical relief earlier than is the patient of the hinterland.

Good surgical care of thyrotoxic goiter demands thorough and painstaking study of the patient by the clinician, surgeon, cardiologist and laboratory worker, whose judgments in evaluating the condition and in planning the treatment to be carried out are combined in the interest of the patient. If adequate preoperative preparation has been conducted, with the use of such drugs as are indicated, with proper sedation and with the maintenance of water balance, all leading to a skilfully planned, timed and performed operation, followed by meticulous watchfulness in the postoperative period, and death ensues—what then?

Bayley [2] reported that fifty-one of 123 deaths due to toxic goiter in the University of Michigan Hospital were preoperative. Eight patients were admitted in severe crisis, six died after operations on organs other than the thyroid, eight died of crisis induced by acute infection, nine died after minor diagnostic procedures such as abdominal paracentesis and spinal puncture. Goetsch [3] analyzed twenty-two deaths following 1,755 operations. Eight patients died after operation; others, before surgical measures could be carried out, died of pneumonia, embolism or primary cardiac failure and crisis. With deaths from goiter, crisis accounts for more than one half the mortality. Seventy per cent of the goiter deaths at Ann Arbor, as reported by Maddock,[1] were due to this cause, about one half occurring before operation. A like preoperative frequency was reported by Lahey [4] in 1928.

Of eighty-eight deaths studied by Ransom and his associates,[5] fifty-one occurred preoperatively and thirty-seven after partial thyroidectomy. In thirty-one cases a bilateral resection or subtotal thyroidectomy was performed. Obviously, as the authors conclude, these were examples of too much surgical intervention. In their series no deaths followed pole ligations and no deaths followed removal of the remaining lobe when stage operations were performed. Yet in our experience deaths have occurred in several instances after pole ligations, even single ligations, and after unilateral resections, from six weeks to two months after ligation and even when the program of preoperative treatment had been most watchfully carried out. That the patient's condition on the table is rarely an index of what the postoperative period will reveal is a fact frequently mentioned and certainly one thoroughly established in our minds.

Kroger and Toland [6] had twenty-seven fatalities in 2,070 cases—all but two of the patients having single stage operations—another example of too much surgical intervention resulting in an unnecessary mortality. Eleven of their patients died in crisis; the authors, in retrospect, were convinced that many could have been saved by graded operative procedures and remarked that "there is no code, no laboratory procedure that will indicate the exact toxic state." They expressed agreement with many that the pulse rate is probably the one best single index of the intensity of the toxemia.

The factors precipitating severe reactions terminating in death vary but little according to the reports of all recent investigations. Delay, inadequate preoperative preparation, surgical procedures not properly planned, infection, minor diagnostic and therapeutic procedures, an age of 60 or more, emaciation, a basal rate which fails to fall materially, even after prolonged treatment, a loss of weight of 40 pounds (18 Kg.) or more, toxic goiter of from ten to fifteeen years' duration, interminable medication with iodine—all these have been emphasized recently by Ransom and Bayley.[5] These authors feel that the anesthetic is not an important factor, at least not nearly as much so as the time and the extent of the operation, an opinion to which we fully subscribe.

It has been suggested that in crisis there is a depletion of sodium or a change in the serum potassium, yet at Ann Arbor normal potassium values were found for fifteen patients seriously ill from hyperthyroidism. Also normal calcium and phosphate values were found for most patients with toxic goiter. In a study by Svend Pedersen and his co-workers,[7] the work of Schneider [8] on the serum sodium content in relation to hepatic damage in hyperthyroidism was not confirmed; in other words, it was apparent to these workers that determinations of the serum sodium have no value in relation to hyperthyroidism. Maddock and his co-workers [1] concluded that searches for abnormalities in inorganic ion concentrations in the blood "have not been fruitful."

We have noted that the accumulation and expectoration of mucus are common, probably because of traumatic tracheitis. Maddock [1] has mentioned the possibility of the condition being due to an increase in circulating epinephrine. Although Bouchard and Claude [9] observed pulmonary edema in rabbits after injection of epinephrine, there is nothing to prove that the collection of mucus in the larger bronchi, so frequently noted in crisis, is due to abnormal adrenal activity. It seems more probable that the edema is due to tracheitis, cardiac failure and, frequently, bronchopneumonia. In the studies of Maddock [1] no positive identification of

2. Bayley, R. H.: Thyroid Crisis, Surg., Gynec. & Obst. **59**: 41-47, 1934.

3. Goetsch, Emil: Mortality in Goiter Operations, Ann. Surg. **94**: 167-178, 1931.

4. Lahey, F. H.: Crisis of Exophthalmic Goiter, New England J. Med. **199**: 255-257, 1928.

5. Ransom, Henry K., and Bayley, R. H.: Thyroid Crisis, West. J. Surg. **42**: 464-475, 1934.

6. Kroger, W. P., and Toland, C. G.: Surgical Mortality in Thyroid Disease, West. J. Surg. **43**: 316-321, 1937.

7. Pedersen, Svend; Maddock, W. G., and Coller, F. A.: Serum Sodium in Relation to Liver Damage and Hyperthyroidism, Proc. Soc. Exper. Biol. & Med. **36**: 491-494, 1937.

8. Schneider, E.: Concerning the Broadening of the Indications for Operation in Exophthalmic Goiter Through the Recognition at the Bedside of a Secondary Thyrogenic Injury to the Liver, Internat. Clin. **2**: 87-98, 1934.

9. Bouchard, C., and Claude, H.: Recherches expérimentales sur l'adrénaline, Compt. rend. Acad. d. sc. **135**: 928, 1902.

substances yielding to the biologic reactions similar to those of epinephrine were found.

Death after operation on the thyroid, provided there has been adequate preoperative preparation, almost always follows too much surgical intervention. As stated by Clute,[10] the "mortality increases as the percentage of one stage operations increases." This author remarks that unexpected deaths after the age of 40 are usually of patients who have had the disease more than one year, who have lost large amounts of weight and who are extremely emaciated.

TABLE 1.—*Ninety-Six Patients with Goiter Who Died in the Hospital*

Classification of Condition	No Operation	Recovery from Operation; Death at Hospital on Subsequent Admission (No Operation)	Death Following Operation	Total
Diffuse hyperplastic goiter	4	3	36	43
Toxic nodular goiter	7	0	29	36
Nontoxic nodular goiter	0	1	6	7
Colloid goiter	0	0	3	3
Acute thyroiditis	1	0	0	1
Carcinoma	3	1 (Biopsy)	2	6
Total deaths	15	5	76	96

Patients with goiter who died in the hospital	96
Deaths following operation	76
Recovery from operation, death on subsequent admission	5
No operation	15
Average postoperative duration of life	3 days, 4 hours
Average age	47 years

PATHOLOGIC ANATOMY

Neither the physiologists nor the pathologists working in the laboratory or autopsy room have been able to cast definite light on the mechanism of hyperthyroid crisis. One rightfully expects precise organic changes characteristic of this complication to be readily discoverable on postmortem examination or on microscopic study of the tissues, but so far this has not been the case.

Heart.—For years it was believed that the cause of death, as suggested by the characteristic tachycardia, the arrhythmias and the uncountable pulse, was cardiac in origin, yet the results of autopsy are surprisingly negative so far as the heart itself is concerned.

In 1886 Moebius,[11] stimulated by Parry's [12] classic communication, suggested the causative association of the thyroid with the disease which is now called hyperthyroidism. Because of the prominent cardiac symptoms, Moebius [11] was led to remark that "Basedow patients die through their hearts." Many theories were advanced to explain the cardiac involvement, particularly the hypertrophy, which is so common. The idea that the hypertrophy was secondary to compression of the trachea and the great vessels in the neck was championed by many investigators. This theory that mechanical alterations were responsible for cardiac hypertrophy was sponsored particularly in Bavaria, Switzerland and the Tyrol, where large colloid goiters are common. However, Kraus,[13] in a series of papers between 1889 and 1906, pointed out that rapid and forceful heart action could occur in patients who did not have the slightest evidence of tracheal obstruction. From these observations Kraus [13] attempted to establish the thyrotoxic heart as a clinical entity. He further made a distinction between the cardiac hypertrophy often observed in patients with a large colloid goiter and the toxic heart found in patients with hyperthyroidism. The first he referred to as "goiter heart," while the second he called "thyrotoxic heart." Chvostek [14] substantiated the observations of Kraus [13] and expressed the opinion that "only in severe cases of exophthalmic goiter is there hypertrophy of the heart."

In 49 per cent of eighty-nine fatal cases of hyperthyroidism without evidence of hypertension or complicating cardiac disease, Kepler and Barnes [15] found that the weight of the heart exceeded maximal standard values calculated on the basis of the patient's weight prior to illness. In twenty-seven of 178 fatal cases they observed congestive failure. In eighteen (67 per cent) there was evidence of coronary sclerosis, hypertension, acute or chronic pericarditis, rheumatic endocarditis or syphilis. In the remaining cases no cause other than hyperthyroidism was found to account for the hypertrophy.

It is obvious that heart disease frequently exists prior to the development of the hyperthyroidism, yet in some instances the cardiac symptoms seem secondary to the extra work thrown on the myocardium by the tremendously increased metabolism. Auricular fibrillation occurs with increasing frequency in each ascending decade and is present in practically all cases of congestive failure.

The experimental evidence that thyroxine has a selective action on heart muscle is none too convincing. Hashimoto,[16] Goodpasture [17] and Takane [18] observed degenerative changes in the heart muscle cells which they thought due to the specific action of thyroxine. On the other hand, Cameron and Carmichael [19] and Rake and McEachern [20] concluded that no significant alterations are produced in the heart by experimentally induced hyperthyroidism.

Liver.—Beaver and Pemberton [21] found a high incidence of degenerative changes in the liver of patients dying in crisis. Weller [22] discovered some hepatitis at autopsy in twenty-two of forty-four selected cases of exophthalmic goiter, finding a like situation in but one of a control series of the same number of cases. Of the Ann Arbor series of patients with hyperthyroidism, 61 per cent showed impaired hepatic function—a condition becoming increasingly more pronounced after operation. Similar observations have been reported by other writers, Frazier,[23] Lahey,[24] Bartels [25] and Beaver

10. Clute, H. M.: The Unexpected Postoperative Fatalities of Hyperthyroidism, S. Clin. North America **11**: 417-421, 1931.

11. Moebius, P. J.: Vom Verhältnisse der Poliencephalitis zur Basedow'schen Krankheit en Jendrassik; in Schmidt, E.; Jahrb. d. Med. **210**: 237, 1886.

12. Parry, C. H.: Collections from the Unpublished Medical Writings of the Late Caleb Hillier Parry, London, Underwood, 1825, vol. 2, p. 3.

13. Kraus, F.: Ueber Kropfherz, Deutsche med. Wchnschr. **32**: 1889, 1906; Berl. klin. Wchnschr. **43**: 1412, 1906; München. med. Wchnschr. **53**: 2224, 1906.

14. Chvostek, F.: Morbus Basedowii und die Hyperthyreosen, Berlin, Julius Springer, 1917; Erscheinungen von Seiten des Zirkulationsapparates, in Enzyklopaedie der klinische Medizin, p. 72.

15. Kepler, E. J., and Barnes, A. R.: Congestive Heart Failure and Hypertrophy in Hyperthyroidism, Am. Heart J. **8**: 102-108, 1932.

16. Hashimoto, H.: Heart in Experimental Hyperthyroidism with Special Reference to Its Histology, Endocrinology **5**: 579, 1921.

17. Goodpasture, E. W.: Myocardial Necrosis in Hyperthyroidism, J. A. M. A. **76**: 1543-1550 (June 4) 1921.

18. Takane, K.: Ueber die experimentelle akute Myokarditis durch Thyroidin und Iodsalze, Virchows Arch. f. path. Anat. **259**: 737-742, 1926.

19. Cameron, A. T., and Carmichael, J.: Comparative Effects of Parathyroid and of Thyroid Feeding on Growth and Organ Hypertrophy in White Rat, Am. J. Physiol. **58**: 1, 1921.

20. Rake, G., and McEachern, D.: A Study of the Heart in Hyperthyroidism, Am. Heart J. **8**: 19-23, 1932.

21. Beaver, D. C., and Pemberton, J. deJ.: The Pathologic Anatomy of the Liver in Exophthalmic Goiter, Ann. Int. Med. **7**: 687-708, 1933.

22. Weller, C. V.: Hepatic Lesions Associated with Exophthalmic Goiter, Tr. A. Am. Physicians **55**: 71-76, 1930.

23. Frazier, C. H., and Brown, R. R.: The Thyroid and the Liver, Tr. Am. A. for the Study of Goiter, 1935, pp. 168-178.

24. Lahey, F. H.: Stage Operations in Severe Hyperthyroidism, Ann. Surg. **104**: 961-970, 1936.

25. Bartels, E. C.: Liver Function in Hyperthyroidism as Determined by the Hippuric Acid Test, New England J. Med. **210**: 1051-1060, 1931.

and Pemberton.[21] The last mentioned authors presented two theories of the causes of reactions: (1) a sudden increase of thyroid secretion and (2) hypersecretion of epinephrine. Goetsch and Ritzmann [26] point out that the common reactions can all be produced by administration of epinephrine; however, Maddock and his associates [1] conclude that (1) preoperative studies of the hepatic function give no indication of the mildness or severity of the postoperative course and (2) in the postoperative period there is an increase in the impairment of hepatic function, with an increase in hyperthyroid reactions, but no evidence to show that one is the cause of the other. Lesions in the liver appear to be an integral part of the syndrome of severe toxic goiter.

The question remains unanswered, however, regarding the cause of these changes. From the standpoint of the pathogenesis of death in goitrous patients, therefore, it appears important to determine whether the lesions occur primarily or as secondary manifestations of profound toxemia.

Thymus.—The thymus gland, because of its intimate relationship to the thyroid, has attracted the attention of many workers. The rapid development of the syndrome known as thyroid crisis and the frequent, often sudden, death of the patient have led to the belief that the complication may be associated in some way with a dysfunction of the thymus. While so-called thymic death does not resemble in many respects death from

TABLE 2.—*Fifteen Patients Who Died Without Operation*

	Diffuse Hyperplastic Goiter	Toxic Nodular Goiter	Carcinoma	Thyroiditis
Deaths	4	7	3	1
Age (average)	42	61	59	32
Sex				
Male	4	1	1	1
Female	0	6	2	
Duration of toxemia	18 mo.	6 mo.	14 mo.	?
Duration of goiter	13 mo.	23 yr.	15 yr.	38 yr.
Cause of Death				
Diffuse Hyperplastic Goiter				
Hypertension, myocardiofibrosis, cardiac failure and cirrhosis of the liver				1
Subacute bacterial endocarditis, pericarditis, myocarditis, crisis				1
Cardiac failure, chronic osteomyelitis of left femur, draining sinuses				1
Arteriosclerotic heart disease, cardiac failure, bilateral pleural effusion, crisis				1
Toxic Nodular Goiter				
Crisis and cardiac failure				2
Cardiac failure				2
Crisis, respiratory and cardiac failure				1
Diabetes mellitus				1
Coronary occlusion				1
Carcinoma				
Tracheal obstruction				2
Generalized metastases				1
Acute Thyroiditis				
Acute thyroiditis, with no recognized complications				1

thyroid crisis, the majority of patients dying in crisis will be found, at autopsy, to have a persistent and hypertrophied thymus.

The first report of the association of a hypertrophied thymus with thyroid disease was made by Markham [27] in 1858. Numerous reports confirming his observations are found in the literature, the most comprehensive being those of Matti,[28] MacKenzie,[29] Blackford and Freligh,[30] Crotti,[31] Giordano,[32] Potter [33] and Margolis.[34] Blackford and Freligh,[30] in a study of 117 necropsies on patients who had had thyroid disease, found hypertrophy of the thymus in every patient under 40 years of age with a hyperplastic gland and in every patient under 30 years of age with a nonhyperplastic gland. They considered thymic hypertrophy and lymphoid hyperplasia a result of the intoxication rather than a

TABLE 3.—*Patients Who Died After Operation*

	Diffuse Hyperplastic Goiter	Toxic Nodular Goiter	Nontoxic Nodular Goiter	Colloid Goiter	Carcinoma
Deaths	36	29	6	3	2
Age (average)	39.3	54	52	25	57
Sex					
Male	6	4	1	3	0
Female	30	25	5	0	2
Duration of goiter	5 yr.	23 yr.	13 yr.	6 yr.	
Duration of toxemia	18 mo.	21 mo.			
Weight loss, pounds	25.3	21.6	11	0	36.67
(% of normal weight)	18	14.66	7.1		18.6
Pulse rate on admission	125	109	95.3	80	107
Preoperative pulse rate	101	87	87	86	98
Fall in pulse rate	24	22	8.3	3	11

contributing factor in it. Margolis,[34] in a more recent postmortem study of eighty-five cases of thyroid disease, observed hyperplasia of the thymus gland in 85 per cent of the patients with exophthalmic goiter and in 53 per cent of the patients with adenomatous goiter. He concluded that the possible significance of the hyperplasia may represent a constitutional, inherent disposition to the development of hyperthyroidism.

CAUSE OF DEATH IN TWENTY-NINE CASES

At the Geisinger Memorial Hospital, in the past twenty-three years, ninety-six patients suffering from thyroid disease have died. Postmortem examinations were made of twenty-nine of these patients. The diagnosis of exophthalmic goiter was made for eleven, the diagnosis of nodular toxic goiter for thirteen and the diagnosis of nodular nontoxic goiter for one. For the remaining four the diagnosis was carcinoma.

Death in nine of the twenty-nine cases was obviously due not strictly to thyroid crisis but to associated conditions fully recognizable before death. In this group the following diagnoses were made: adenocarcinoma (four), cerebral hemorrhage (one), tracheal obstruction, abductor palsy (one), diabetes mellitus (one), infarct of the left lung (one) and secondary hemorrhage, postoperative (one).

The immediate cause of death in twenty of the twenty-nine cases was, clinically, crisis. However, in nine the necropsy indicated that other conditions were responsible for the patient's death. In each of these there was present an overwhelming infection, antedating the symptoms of crisis and being of sufficient magnitude to be considered the principal cause of death. The following conditions were recorded at necropsy: multiple abscesses of kidneys, acute mitral endocarditis, strepto-

26. Goetsch, Emil, and Ritzmann, A. J. Jr.: Thyroid Disorders: the Suprarenal Factor in Reactions to Thyroidectomy, Arch. Surg. **29**: 492-510 (Sept.) 1934.

27. Markham: Affection of the Heart with Enlargement of the Thyroid and Thymus Glands and Prominence of the Eyes, Tr. Path. Soc. London **9**: 163-164, 1857-1858.

28. Matti, H.: Deutsche Ztschr. f. Chir. **116**: 425, 1912; quoted by Frazier and Brown.[20]

29. MacKenzie, H.: Exophthalmic Goiter, Lancet **2**: 815-821, 1916.

30. Blackford, J. M., and Freligh, W. P.: The Thymus in Adults with Especial Reference to Goiter, Collect. Papers Mayo Clin. **8**: 507-512, 1916.

31. Crotti, Andre: Thyroid and Thymus, ed. 2, Philadelphia, Lea & Febiger, 1922, p. 750.

32. Giordano, A. S.: The Frequency of Thymic Hyperplasia in Toxic and Nontoxic Goiters, J. Indiana M. A. **16**: 362-366, 1923.

33. Potter, E. B.: Persistent Thymus in Exophthalmic Goiter, Warthin Ann. Vol. 1927, pp. 205-220.

34. Margolis, Harry M.: Possible Significance of the Thymus Gland in the Syndrome of Hyperthyroidism, Ann. Int. Med. **4**: 1112-1133, 1931.

coccic septicemia, acute purulent pericarditis, miliary tuberculosis, empyema and, in four instances, bilateral bronchopneumonia.

The eleven cases in which no other death producing factor was found can rightfully be considered instances of true "thyroid crisis" death, and it is this group that warrants particular study.

As has been mentioned, postmortem examination has been directed especially toward the heart, liver and thymus. The bulk of recorded observations have largely been limited to these organs and, as we observed no significant changes elsewhere, we will consider these organs particularly.

A normal heart was found in three patients who died in crisis. The remainder showed one or more gross or microscopic changes, always associated with other evidence of cardiovascular diseases. Five of the hearts were hypertrophied, while seven showed varying degrees of myocardiofibrosis. In four hearts the coronary arteries were sclerotic, and in one there was found healed mitral endocarditis. Myocardosis occurred five times and always in subjects who showed evidence of toxic changes in the parenchymatous organs.

From a correlation of our clinical and postmortem studies we believe that there is not sufficient proof to indict the heart as the primary site of the difficulty in patients in whom thyroid crisis develops. Certainly such patients may die a so-called cardiac death, but, in the absence of specific myocardial lesions, it is safe to assume that the heart failure is on a physiologic rather than a pathologic basis.

There was but one normal liver in the cases of true crisis death. Ten of the eleven subjects showed varying degrees of necrosis in the center of the lobules. There were eight necropsies in which fatty degeneration of the liver cells was a prominent feature. This change was more marked in the livers in which necrosis was extensive. Cellular infiltration was present in three organs and congestion in one, the latter occurring in a patient who had healed mitral endocarditis.

Our attempt to correlate the degree of injury to the liver with the degree of toxemia was unsuccessful. The usual association of hepatitis with thyroid disease cannot be disputed, but, as mentioned in a preceding paragraph, it has not been determined whether the changes in the liver occur as primary or as secondary manifestations.

Hypertrophy of the thymus was found in fourteen of the twenty-nine patients. For nine there was found no cause of death other than crisis. The remaining five had hyperplastic thyroids but had died not in crisis but as the result of severe infection.

Our observations so far as the heart, liver and thymus are concerned are in agreement with the majority of the reports of similar studies. It is apparent that the pathologist has little more to offer, and it remains for the physiologist and experimental pathologist to discover the true nature of the toxemia that is responsible for the "thyroid crisis" death.

CONCLUSIONS

1. The mechanism of hyperthyroid crisis is as yet but little understood.

2. Neither the heart, liver, thyroid nor thymus seems, alone, to be at fault.

3. That acute hepatic insufficiency is a contributing factor is accepted, but there is not definite evidence to prove that it has the major role.

4. Sudden death soon after so slight a trauma as that of pole ligation cannot be accounted for entirely by damage to the liver.

5. That there is extreme stimulation of cellular metabolism, the exciting factors of which are little understood, is generally believed. There is, however, no proof that these follow sudden hypersecretion of thyroxine, epinephrine or both.

6. Evidence points to acute dysfunction not only of the thyroid but possibly of other glands of the endocrine system, including the pituitary.

7. Postoperative crisis in association with typical exophthalmic goiter is now uncommon. Today unexpected postoperative deaths are largely confined to aged patients suffering from long standing nodular goiter, usually associated with cardiorenal-vascular disease.

8. While myocardial degeneration may, and does frequently, result from long standing hyperthyroidism, it is coexisting myocardiovascular degeneration plus some unknown factor or factors associated with acute hyperthyroidism which combine in producing crisis causing death.

9. The pathologist has cast no definite light on the pathogenesis of crisis. Neither does he explain sudden postoperative death in cases of toxic goiter. There is much yet to be elucidated by the physiologist and experimental pathologist before the pathogenesis of postoperative hyperthyroid crisis is understood.

TUMORS OF LATERAL ABERRANT THYROID ORIGIN

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Lateral aberrant thyroid tumors occur as the result of an anomaly in the development of the thyroid gland. Histologically these tumors are not composed of normal thyroid tissue but have a papillary structure indistinguishable from that of papillary tumors of the thyroid.

In forty-five of the 136 reported cases of tumors arising in lateral aberrant thyroid tissue, as shown in the accompanying table, the growth has been classified as malignant. Yet only two of the forty-five patients have been reported to have died as a result of recurrence of the tumor following operation. In no case has either local or distant metastasis of the tumor been proved. The remarkable survival record of the patients cannot fail to raise the question of whether or not the tumors were true carcinomas.

Many of the tumors in the collected series were described as showing extensive metastasis to the cervical lymph nodes. Similarly it has been repeatedly stated in the literature [1] that metastasis to the regional lymph nodes is commonly seen in patients with papillary carcinomas of the thyroid. In more than fifty cases of papillary tumors of the thyroid observed at the Cleveland Clinic there has been no demonstrable metastasis to lymph nodes.[2]

Recently it has been recognized [3] that in the presence of lateral aberrant thyroid tumors the thyroid gland is apt to contain, coincidentally, one or more papillary

From the Cleveland Clinic.

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1. Barnabo, V.: Contribution to the Knowledge of Malignant Tumors of the Accessory Thyroid Glands, Policlinico (sez. chir.) **17**: 112-124, 1910. Albert, E.: Lehrbuch der speziellen Chirurgie, Vienna, Urban and Schwarzenberg, 1897, vol. 1, p. 235.

2. Crile, George, Jr.: Papillary Tumors of Thyroid and Lateral Aberrant Thyroid Origin, Surg., Gynec. & Obst. **69**: 39 (July) 1939.

3. Eberts, E. M.: Lateral Cervical Aberrant Thyroid, Canad. M. A. J. **29**: 32-33 (July) 1933.

tumors similar to those in the lateral cervical regions. It is thus difficult to differentiate between (1) a papillary adenoma of the thyroid associated with multiple papillary adenomas originating in lateral aberrant thyroid tissue and (2) a papillary carcinoma with metastasis to the cervical nodes. Histologically there is little to differentiate the two.

There is a striking tendency for lymphoid tissue to be present in all lateral cervical sinuses, cysts and other embryologic anomalies of the neck. Lateral aberrant thyroid tumors are no exception to this rule, as they also tend to contain considerable lymphoid tissue and may have the histologic appearance of a lymph node containing metastatic carcinoma. The final answer to the question as to whether these tumors are benign primary tumors or metastatic carcinomas must be decided by the clinical course of the disease and the survival of the patient. Since there is no case either in our series or in the remainder of the literature in which the tumor has continued to disseminate itself after operation and has thereby caused the death of the patient, it would appear that these tumors are essentially benign and should not be classified as metastasizing carcinomas of the thyroid.

CLINICAL MATERIAL

In the past fifteen years, seventeen patients with tumors arising in lateral aberrant thyroid tissue have been seen at the Cleveland Clinic. Three cases in this group are of particular interest:

CASE 1 (illustrating the wide distribution of lateral aberrant thyroid tissue).—A married woman aged 27 complained of a painless lump in the posterior triangle of the neck just above the clavicle. Examination showed a slight, firm enlargement of the left lobe of the thyroid, multiple soft movable tumors in the posterior triangle on the left and several small soft nodules deep in the sternomastoid muscle on the right. A clinical diagnosis of tuberculous glands, possible lateral aberrant thyroid tumors, was made and one of the nodules was removed for microscopic examination.

The nodules were papillary adenomas arising in lateral aberrant thyroid tissue. At operation, twenty-five separate nodules were dissected out of the neck and the left lobe of the thyroid was completely removed. This lobe showed diffuse papillomatosis extending medially nearly to the isthmus.

The patient was well one year after operation.

This case is of interest not only because of the large number of lateral cervical nodules that were present but also because of the diffuse papillary adenomatosis of the left lobe of the thyroid. The entire lobe was involved not by a discrete papilloma but by a papillomatosis in which the tumor cells were growing in and through the normal thyroid tissue. This condition suggests that the papillary tumors are of multicentric congenital origin, originating perhaps from rests of the lateral thyroid anlage which normally disappear completely during embryonic life.

CASE 2 (illustrating the slowness of the tumors' growth).—A woman aged 22 had noted a painless lump in the neck six months prior to entry. A diagnosis of tuberculous glands was made and a course of high voltage roentgen treatment was given without improvement. Two glands about 2 cm. in diameter were palpable in the left side of the neck. One of these was removed (by Dr. T. E. Jones) and the pathologist reported the tumor as a papillary adenoma of lateral aberrant thyroid origin.

The patient was not seen again for thirteen years. In response to a follow-up letter she returned, complaining of recurrent nodules in the neck. Examination showed multiple nodules behind the sternomastoid muscle on each side, a firm midline nodule above the isthmus of the thyroid and bilateral firm tumors in the thyroid itself. These tumors were enlarging slowly, but not one was over 4 cm. in diameter and no symptoms of pressure had been noticed. Operation was advised.

The slowness of the growth of such tumors is evident in this case, in which there had been only a slight enlargement in thirteen years. The case is of interest also because of the extensive bilateral distribution both in the thyroid and in the lateral cervical region.

CASE 3 (illustrating the eventual fatal outcome in a case in which surgical intervention was delayed too long).—A man aged 57 had had a large papillary adenoma of the right lobe of the thyroid removed eight years before entry. The tumor gradually recurred and in the past two years had grown rapidly. At the same time a rapidly growing tumor appeared on the left side of the neck. He had been given a course of high voltage roentgen therapy without relief of his symptoms or change in the size of the tumor.

Examination showed an obese man in marked respiratory distress. There were inspiratory stridor and a brassy cough. He found it impossible to breathe when lying flat. Large multiple bilateral cervical tumors were present.

X-ray examination of the chest showed that the trachea at the level of the thoracic outlet was compressed by the tumor and that on the left side the tumor descended well below the arch of the aorta. The superficial veins of the neck and chest were dilated.

At operation, eleven large separate lateral aberrant thyroid tumors were removed from the right side of the neck (fig. 1). The jugular vein was enormously dilated and adherent to the tumors, which surrounded it on three sides. It was necessary to remove the vein with the tumor mass. The carotid artery and vagus nerve were carefully dissected away from the tumors and were preserved intact.

From the time of operation until the patient's death, five hours later, bradycardia and Cheyne-Stokes respiration were present. Consciousness was never regained. Postmortem examination showed that the left jugular and subclavian veins were completely obliterated by large tumor masses, which extended into the mediastinum to a point well below the base

Summary of Literature on Lateral Aberrant Thyroid Since the Report of A. R. Moritz and Francis Bayless (Lateral Cervical Tumors of Aberrant Thyroid Tissue, Arch. Surg. 26: 1028 [June] 1932) of 109 Cases

Author	Number of Cases
Cases of Malignant Tumors Since 1932	
Eberts[3]	3
d'Abreu, A. L.: Lancet **2**:1406-1480 (Dec. 21) 1935	1
Kaplan, Ira I.: Am. J. Surg. **23**:559-562 (March) 1934	1
Hentz, V. G.: M. Rec. **142**:416-418 (Nov. 6) 1935	1
Tjokronegoro, S.: Geneesk. tijdschr. v. Nederl.-Indië **74**:200-206 (Feb. 13) 1934; abstracted, Am. J. Cancer **23**:383 (Feb.) 1935	3
Van den Wildenberg, L., and Dupont, A.: Rev. belge sc. méd. **3**:828-830 (Aug.-Sept.) 1931	1
Onufrio, O.: Arch. ital. di anat. e istol. pat. **5**:935-959 (Nov.-Dec.) 1934	1
Chwat, S.: Oto-rhino-laryng. **21**:65-68 (Feb.) 1937	1
Noordenbos, W.: Ned.rl. tijdschr. v. geneesk. **78**:2578-2589 (June 9) 1934	2
Total	14
Cases of Benign Tumors Since 1932	
Forty, Frank: Brit. J. Surg. **20**:695-698 (April) 1933	1
Lawton, S. E.: Surg., Gynec. & Obst. **56**:696-699 (March) 1933	3
Probstein, J. G., and Agress, H.: New England J. Med. **214**:1191-1193 (June 11) 1936	1
Vidgoff, I. J.: West. J. Surg. **40**:566-568 (Oct.) 1932	1
Lazarus, J. A., and Rosenthal, A. A.: Ann. Surg. **98**:1023-1029 (Dec.) 1933	1
Schmeisser, H. C.: South. M. J. **29**:1174-1178 (Dec.) 1936	1
Greteman, T. J., and Russum, B.: Nebraska M. J. **21**:384-386 (Oct.) 1936	1
Van de Wildenberg: Ann. d'oto-laryng., pp. 949-966, Oct. 1934	3
Total	12

of the heart. Apparently all venous return from the left side of the neck had been blocked by these tumors. On the right the resection of the internal jugular vein and ligation of the external jugular vein had resulted in interference with the circulatory return from the brain, and death was caused by cerebral congestion and anoxemia.

This case is of particular interest because it is the only one in this series in which death resulted from lateral aberrant thyroid tumors. It indicates that, although these tumors do not metastasize, they may slowly and progressively enlarge and may ultimately become inoperable and cause death by pressure. For this reason patients with lateral aberrant thyroid tumors should be operated on while the tumors are still small and can be easily removed.

SUMMARY OF SEVENTEEN CASES

Incidence.—In the past fifteen years, seventeen tumors of lateral aberrant thyroid origin have been recognized at the Cleveland Clinic. Nine of the seventeen patients have been operated on in the past two years.

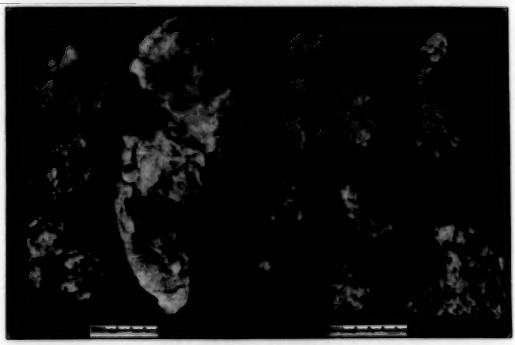

Fig. 1 (case 3).—Gross specimen of multiple lateral aberrant thyroid tumors.

Age.—The age of the patients varied from 10 to 57 years, the average age being 36. Thirty-five per cent of the patients were between 20 and 30.

Sex.—Tumors arising in lateral aberrant thyroid tissue are more common in women than in men, the ratio being 13 to 4 in this series.

Race.—Eight of the seventeen patients in this series were of Jewish extraction.

Symptoms.—A painless lump which either enlarged very slowly or not at all was the most common symptom. Eighteen per cent of the patients had not noticed the tumor and it was discovered only during examination or operation for a goiter. In only 12 per cent was the mass either painful or tender. Twelve per cent had severe symptoms of pressure.

Examination.—The lumps were usually described as firm and were generally considered to be lymph nodes. The extensiveness of the distribution of the nodules was rarely apparent from external examination, their location deep beneath the sternomastoid muscle rendering them very difficult to palpate. In the cases of multiple tumors in which the thyroid was similarly involved, the affected lobe was hard and suggested the presence of either thyroiditis or a malignant process.

Distribution of Nodules.—The lateral aberrant thyroid tissue was found in all triangles of the neck. In six cases the nodules were on the left and in six cases on the right; in the remaining five cases they were bilateral. It should be noted that, in all the nine cases in which more than six lateral aberrant thyroid nodules were present, one lobe of the thyroid was involved in a similar pathologic process. In five of these nine cases the tumors were present in the superior mediastinum. The nodules were also found posterior to the trachea and posterior to the carotid sheath.

Number of Nodules.—The number of nodules present varied from one to twenty-five, averaging seven. In nine cases there were six or more separate tumors. In the case in which twenty-five nodules were present, the actual count could be increased to thirty or more by separating tumors which were adherent to one another but were removed in a single mass.

Thyroid Gland.—One of the seventeen patients had an adenomatous goiter without hyperthyroidism and one had an adenomatous goiter with hyperthyroidism. In eleven cases it was found that the same pathologic process was going on in the thyroid as in the lateral aberrant tissue.

There was a benign papillary adenoma in three cases, a papillary carcinoma in five cases, a malignant adenoma (no papillary structure) in one case and a hard nodule palpable in the thyroid (patient refused operation) in two cases.

In only four cases was the thyroid normal.

In the cases classified as instances of papillary carcinomas, the tumors were low grade malignant growths difficult to differentiate from benign tumors (fig. 2).

Histologic Aspects of Lateral Aberrant Thyroid Tissue.—In eleven cases the lateral cervical nodules were benign papillary adenomas, in five cases the tumors were papillary carcinomas and in one case they were malignant adenomas with no papillary structure present. In this case veins were invaded by tumor tissue and each of the seventeen tumors was apparently an independent malignant adenoma with a structure similar to that of the malignant adenoma in the lobe of the thyroid. A determination of the iodine content done on lateral aberrant thyroid tissue classified as papillary adenoma showed 3.41 micrograms of iodine per hundred milligrams of tissue.

Diagnosis.—In six of the seventeen cases the correct diagnosis was made before operation, and in two additional cases the diagnosis of lateral aberrant thyroid was considered but other diagnoses were preferred. In all the cases in which the correct diagnosis was made, the lobe of the thyroid on the affected side was involved.

The distribution and consistency of the nodules usually suggest that they are lymph nodes. The preoperative diagnoses in the seventeen cases were lateral aberrant thyroid in six, metastatic carcinoma of the thyroid (? lateral aberrant thyroid) in one, tuberculous glands (? lateral aberrant thyroid) in one, tuberculous glands in three, branchial cleft cyst in two, nodules unsuspected until operation (thyroidectomy) in two, lymphoma in one and abscess in one.

At operation the nodules are usually recognized as lateral aberrant thyroid tissue. When cystic there is a

characteristic bluish discoloration similar to that of a cystic adenoma of the thyroid. When solid they are reddish and resemble thyroid tissue.

The vascularity of the tumors and the presence of large blood vessels in their capsules differentiate them from lymph nodes. In some cases the tumors are adherent to one another and to surrounding structures. They are characteristically surrounded by thick, hyaline, fibrous or fatty capsules, the gross appearance of which serves to differentiate them from lymph nodes. It is the gross rather than the microscopic appearances that establish the diagnosis and rule out the possibility of metastatic carcinoma.

The most important distinguishing feature of these lateral cervical tumors is their association in over half of the cases with a hard tumor in the thyroid gland. The finding of a hard thyroid tumor and one or more firm lateral cervical nodules is sufficient evidence on which to base a diagnosis of lateral aberrant thyroid tumor.

End Results.—One of the seventeen patients in this series has not been heard from since operation, one has just been operated on and a third died after operation. None of the remaining fourteen patients, all of whom have been followed for periods varying from six months to thirteen years (an average of nearly four years), have died as a result of thyroid disease or lateral aberrant thyroid tumors, and at the present time no patient is known to be suffering any disability as a result of recurrence. Only two patients received high voltage roentgen therapy after operation.

To date, six of the seventeen patients have had a recurrence. Two of the patients with a recurrence have refused operation, but with the other patients the disease has been controlled by a second operation. The patients in whom the tumors recurred were operated on in the days before we appreciated the wide distribution of the nodules or the necessity of careful and extensive exploration of the neck. The recurrent tumors did not represent true recurrences of tumors removed but were primary tumors which had been overlooked at the time of the first operation.

Roentgen Therapy.—Five of the seventeen patients in this series received roentgen therapy before operation. In none was there any appreciable diminution in the size of the nodules, nor did the treatment induce any evidences of degeneration of the tumor.

Tumors arising in lateral aberrant thyroid tissue grow slowly and are well differentiated. Since permanent cure has been effected in all patients subjected to surgical intervention alone, there is no indication for adding roentgen therapy to operation in the treatment of lateral aberrant thyroid tumors that have been cleanly excised.

CONCLUSIONS

Papillary tumors of the thyroid, whether found in the thyroid proper or in the lateral cervical region, are remarkably benign and do not tend to metastasize. Local recurrence may take place if the tumors are incompletely removed or if the presence of additional tumors is overlooked at the time of operation.

Roentgen therapy has not been effective in arresting the growth of these tumors. Reliance must therefore be placed on their complete excision by surgical means.

In every case in which a papillary tumor is found in the thyroid, careful exploration of the neck for similar tumors of lateral aberrant thyroid origin should be undertaken. Similarly, when a lateral aberrant thyroid tumor is found, the thyroid gland should always be explored to rule out the presence of a coexistent papillary tumor.

It is probable that many cases reported in the literature as instances of papillary carcinoma of the thyroid with metastasis to the cervical lymph nodes are in reality instances of benign papillary adenoma of the thyroid with multiple primary aberrant thyroid tumors coincidentally present in the lateral cervical region. What may at first appear to be a hopelessly inoperable carcinoma with extensive metastasis may be cured by a persistent surgical attack.

SUMMARY

1. It may be difficult both clinically and pathologically to distinguish between multiple primary lateral aberrant thyroid tumors and metastases from a papillary carcinoma of the thyroid.

Fig. 2.—Typical benign papillary adenoma of the thyroid from a patient with multiple lateral aberrant thyroid nodules.

2. Papillary carcinomas of the thyroid have not, in my experience, metastasized to the cervical lymph nodes.

3. In eight of seventeen cases of lateral aberrant thyroid tumors, tumors histologically identical with the lateral cervical nodules were present in the thyroid gland.

4. It has not been proved that either distant or local metastasis occurs from papillary tumors of lateral aberrant thyroid origin.

5. It is probable that many cases reported as instances of papillary carcinoma of the thyroid with metastasis to the regional lymph nodes are in reality instances of benign papillary lateral aberrant thyroid tumors with a coexistent benign tumor in the thyroid gland.

6. Irradiation has not been effective in the treatment of lateral aberrant thyroid tumors. Surgical intervention is the treatment of choice for all papillary tumors of thyroid or lateral aberrant thyroid origin.

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INTRATHORACIC GOITER

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In spite of the fact that many authors have repeatedly written about the dangers of permitting adenomatous goiters to become intrathoracic, the likelihood and dangers of this occurrence are still not sufficiently appreciated. Failure to remove an adenomatous goiter which is extending beneath the clavicles and sternum before it has become deeply intrathoracic constantly results in the patient's being exposed to the necessity of submitting himself to a procedure involving a dissection deep in the mediastinum, to the dangers and mechanical difficulties of extracting a large adenomatous tumor from deep in the superior mediastinum and to the often perplexing problem of making a mediastinal tumor twice the diameter of the superior thoracic strait pass through that aperture in its surgical delivery.

The most common type of goiter which becomes intrathoracic is the discrete adenoma originating as a small single adenoma in the lower pole of the thyroid and gradually descending beneath the sternum and clavicle until it is no longer located in the neck but has so descended that it is now within the thoracic cage itself. In writing on this subject previously I have called attention to the fact that, once the discrete adenoma becomes located within the thoracic cage and enlarges

Fig. 1.—Enormous intrathoracic goiter. Obviously this can be removed without taking off the clavicles and the manubrium only by collapsing its center and so diminishing its diameter. Note the sharpness of outline typical of the intrathoracic discrete adenoma.

in diameter, the outflaring of the upper portion of the thoracic cage necessitates further and further descent of the spherical mass as its diameter increases. Occasionally there will occur intrathoracic cysts of the thyroid, since thyroid cysts are brought about by liquefaction of the central portion of an adenoma until its solid portion is replaced by fluid retained by the fibrous capsule of the adenoma. The fact that but a limited number of such intrathoracic thyroid cysts have been seen at the Lahey clinic leads my associates and me to believe that this is not a common type of intrathoracic goiter.

Next to discrete adenomas, multiple colloid adenomatous goiters, particularly of the endemic variety, have, according to our experience, been most prone to become

Fig. 2.—Typical deviation of the trachea from a laterally placed adenomatous goiter wedged in the upper thoracic aperture, with tracheal narrowing. Note the caliber of the trachea at the upper arrow and the narrowed trachea at the lower arrow.

intrathoracic. Most multiple colloid adenomatous goiters tend to enlarge upward and outward on the neck, producing large and unsightly goiters. This is due to the fact that the enlargement of the thyroid in this form of thyroid degeneration is general throughout the entire thyroid gland and not local, as is the case with discrete adenomas. In our fairly large experience with intrathoracic goiter there have been a considerable number of multiple colloid adenomatous goiters which have become deeply intrathoracic.

THE MECHANISM OF THE DESCENT OF INTRATHORACIC GOITER INTO THE MEDIASTINUM

When an adenoma occurs in the thyroid, particularly in the isthmus or the lower pole of the gland, all the factors are present for propelling that tumor into the superior mediastinum. The adenoma rests above an unobstructed superior thoracic strait bounded on the front by the clavicles and the sternum and on the sides and back by the vertebrae and the first rib. Any discrete tumor arising in the lower pole of the thyroid gland, covered as it is by the sternohyoid, sternothyroid and omohyoid muscles, which limit upward extension by their attachments to the hyoid and thyroid cartilage and which are inserted into the chest wall in front, is subjected to pressure in the downward direction with every act of swallowing.

UNDESIRABLE EFFECTS OF INTRATHORACIC GOITER

The dangerous effects of intrathoracic goiter are the result of pressure from the adenomatous goiter on the

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side walls of the trachea, producing lateral deviation and lateral narrowing of that structure (fig. 2). When bilateral adenomas of the thyroid descend into the mediastinum, the effects on the trachea are the result of bilateral pressure as the tumors impinge on the lateral walls of the upper thoracic strait, particularly the right and left first rib, resulting in bilateral pressure and lateral collapse of the trachea. This produces the so-called scabbard trachea as shown in figure 3. When the adenoma arises in the isthmus and descends behind the sternum, anteroposterior pressure is exerted on that structure and anteroposterior collapse of the trachea occurs (fig. 4).

The other undesirable effect of intrathoracic goiter is on the cerebral venous circulation. When an intrathoracic goiter passes through the upper thoracic aperture it exerts marked pressure on the large internal jugular veins, thus interfering with the return of venous blood from the head and neck. We have demonstrated conclusivey from readings of the venous pressure before and after the removal of intrathoracic goiters that there

Fig. 3.—Bilateral pressure on the trachea producing bilateral narrowing at the point indicated by the arrows.

is a distinct rise in venous pressure in the veins above the intrathoracic goiter and that this promptly drops with the removal of the intrathoracic mass. This in itself perhaps produces no great difficulty, but it seems at least possible that the rapid change in cerebral venous pressure which results from the sudden removal of the obstructing mass when the intrathoracic goiter is rapidly delivered may be an undesirable factor, possibly playing some part in the mortality attached to the removal of large and deep intrathoracic adenomas.

SYMPTOMS OF INTRATHORACIC GOITER

The symptoms of intrathoracic goiter are directly related to the foregoing facts. Associated with the narrow trachea caused by anteroposterior, bilateral or lateral pressure on the trachea is an interference with free breathing. This obstruction to respiration may evidence itself with the head held in any position by noisy and stridulous breathing, particularly on exertion, when there is an unusual demand for air. When there is anteroposterior collapse of the trachea due to an adenoma arising in the isthmus, it may evidence itself only as the patient bends over and thus crowds the medially located adenoma further against the trachea and produces further tracheal collapse. It may evidence itself when the adenoma deviates the trachea to one side, producing lateral collapse only when the head is tilted to one side, thus causing the adenoma to impinge on the right or left first rib to serve as a fulcrum and make additional lateral pressure on the already partially collapsed trachea.

Fig. 4.—Anteroposterior collapse of the trachea from an adenoma arising in the isthmus and wedged behind the sternum. Note the caliber of the trachea above and the narrowness of the treachea at the point where it enters the thoracic cavity.

The effects of pressure from an intrathoracic goiter partly obstructing the return of venous supply from the head and neck by pressure on the internal jugular veins evidence themselves by the dilatation of the superficial veins of the upper part of the chest and neck, compensatorily enlarged to take care of the return venous supply from the head (fig. 5). When the obstruction to the internal

Fig. 5.—*A*, an infra-red photograph showing the normal superficial thoracic veins. *B*, an infra-red photograph showing the dilatation of the superficial thoracic veins in a patient with intrathoracic goiter. Even in this photograph one can appreciate the moderate edema of the neck and lower portion of the face.

jugular veins is fairly complete, this may even evidence itself by edema of the face, as revealed by the putty-like features secondary to the facial edema shown in figure 6.

THE DIAGNOSIS OF INTRATHORACIC GOITER

Whenever, particularly in a patient with adenomatous goiter, it is impossible to palpate definitely the lower pole of the thyroid as the patient swallows, when with the act of swallowing the enlarged thyroid can still be felt to extend below the point of the palpating finger,

Fig. 6.—Putty-like features associated with edema due to pressure on the internal jugular vein from an intrathoracic goiter.

one should be suspicious that the goiter is already intrathoracic or is definitely becoming so. When an intrathoracic goiter has become definitely located within the superior mediastinum, particularly when it is on one side of the trachea, it is usually possible to detect

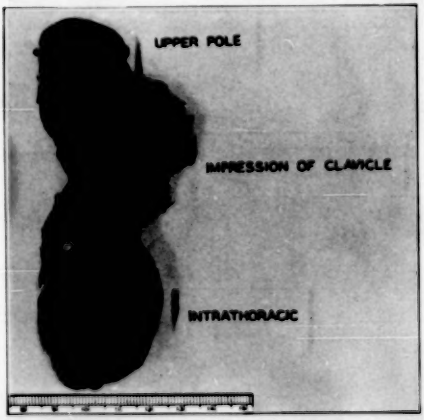

Fig. 7.—The typical tongue of intrathoracic goiter extending from the lower pole of the thyroid into the thorax beside the trachea, not producing the spherical outline seen in figure 1. It is such tongues of intrathoracic adenomatous tissue that are sometimes overlooked if not demonstrated by x-ray examination.

dulness on percussion in the upper part of the chest over the tumor. When a discrete adenoma located in a lobe of the thyroid has descended into the mediastinum and has produced marked deviation of the trachea, it is frequently possible by palpation of the trachea to demonstrate that that structure has been markedly distorted to a lateral location well outside its normal median position. The diagnosis of intrathoracic goiter can be definitely established by roentgenograms, for roentgenograms demonstrate the extension of the shadow of the thyroid into the mediastinum with or without lateral deviation of the trachea by the intrathoracic mass or anteroposterior collapse.

If one thing has been impressed on our minds in dealing with a large number of patients having intrathoracic goiter, it has been the ease with which such goiters can be overlooked in the course of routine examination. So frequently do tongues of multiple adenomatous goiters extend into the mediastinum beside or behind the trachea without evidence of tracheal pressure, without respiratory obstruction and without pressure on the internal jugular vein, that we have for several years made it a custom to make roentgenograms of the superior mediastinum of all patients with multiple colloid adenomatous goiter. This we know to be

Fig. 8.—A tongue of intrathoracic goiter extending into the chest beside the trachea.

extremely important, lest such extension of thyroid adenomatous tissue into the mediastinum be overlooked and at operation the anterior portion of the thyroid only be removed and its posterior shell of thyroid tissue, together with its intrathoracic prolongation, be unrecognized and left behind, only later to enlarge and require further surgical procedures.

ANESTHESIA IN OPERATIONS FOR INTRATHORACIC GOITER

In our earlier experiences with deep intrathoracic goiters we, to say nothing of the patients, had some hair-raising experiences in attempting to get enough air and anesthetic mixture into the patient while the unintubed trachea was collapsed by the pressure of the intrathoracic mass as it was being delivered through the superior thoracic strait. With the introduction of the rigid intratracheal catheter this difficulty has now been entirely obviated. As a result of our experience in such cases we feel that no intrathoracic goiter of any considerable depth in the mediastinum should be removed without first introducing a rigid walled catheter

into the trachea. This makes it certain that both air and anesthetic mixture can be supplied to the patient no matter how vigorous the manipulations may be in the extraction of the intrathoracic tumor.

One of the greatest aids which we have developed in the anesthetic management of patients with intrathoracic goiter has been the employment of helium mixed with oxygen and cyclopropane. This has permitted us to get the patient with a deep intrathoracic goiter and narrowed trachea sufficiently anesthetized and relaxed so that an intratracheal catheter could be readily introduced through the cords even when under direct laryngoscopic vision the larynx and trachea were markedly distorted. This was one of the unsatisfactory problems with which we had to deal before our anesthetists applied helium, oxygen and cyclopropane to overcome the difficulty. When the trachea was markedly narrowed by an intrathoracic mass and the anesthetic was administered, because of spasm, mucus and induction difficulties it was often almost impossible to anesthetize the patient so that relaxation could be obtained to a sufficient degree to make possible exposure of the larynx through the laryngoscope and the introduction

Fig. 9.—This patient with an intrathoracic goiter had previously had her manubrium removed, together with the inner aspects of her clavicles, and had been rejected as having an inoperable mass. The adenoma was later removed without difficulty by collapsing its center; it could have been taken out originally without removing the manubrium and clavicles had this procedure been followed.

of the rigid catheter through the cords. By the use of helium, oxygen and cyclopropane this difficulty has now been largely overcome. Since helium has such a low molecular weight—the molecular weight is 4, compared with the molecular weight of 32 for oxygen—it can be so mixed with oxygen that it serves the purpose of thinning oxygen, as kerosene will thin cylinder oil, and thus make it possible to introduce greater quantities of oxygen through a smaller aperture. Fortunately, helium in itself is metabolically inert and can therefore be used purely as a diluting mixture. By the employment of 80 per cent helium mixed with 20 per cent oxygen, three times as much oxygen can be passed through an aperture of given size as will pass through when pure oxygen is introduced undiluted. The use of this mixture has been a valuable measure, therefore, in producing the depth of anesthesia necessary for the relaxation required to introduce the intratracheal catheter.

Two types of intratracheal tubes are employed in the production of intratracheal anesthesia: (1) the flexible metal walled catheter and (2) the rubber (Magill) catheter.

As the result of a large experience with intrathoracic goiter before the days of tracheal intubation and further

Fig. 10.—An enormous intrathoracic goiter, demonstrating the depth to which such goiters can extend.

experience with this condition after the development of intratracheal catheters, it is our opinion that when there is the slightest question of deviation of the trachea or extension of the goiter into the mediastinum an intratracheal catheter should be introduced. While it is possible to introduce an intratracheal catheter in the midst of the operation, it is an undesirable manipulation to have to undertake at this time. Its preoperative introduction requires but a few moments effort, and it is distinctly desirable in all cases of doubtful involvement to have the intratracheal catheter already in place before the operation is undertaken.

Fig. 11.—A deep intrathoracic goiter which had extended partly behind the treachea and had narrowed that structure; it was successfully removed.

SURGICAL REMOVAL OF INTRATHORACIC GOITER

The most important single feature relating to the surgical removal of deep intrathoracic extensions of thyroid tissue is the control of their blood supply before their surgical manipulation within the mediastinum is undertaken. Since the separation of the intrathoracic mass from its surrounding condensed connective tissue and pleura must be accomplished by finger manipulation within the mediastinum, it is undesirable and unnecessary that hemorrhage occur at this time, the blood supply can be so well controlled. The blood supply to an intrathoracic goiter comes

entirely from above, from the superior and the inferior thyroid arteries. The venous supply is largely from branches from the thyroid to the internal jugular vein. It is possible to demonstrate and ligate both the superior and the inferior thyroid arteries in all cases before any attempt is made toward removal of the intrathoracic mass. It is likewise possible to ligate all the venous connections between the thyroid and the internal jugular vein before any approach is made to the intrathoracic goiter. The first step, then, of the removal of any deep intrathoracic goiter is that the superior and inferior thyroid arteries be demonstrated and doubly ligated and the vessels cut between ligatures. All the veins running from the thyroid to the internal jugular vein are doubly ligated and cut between ligatures, thus making the intrathoracic mass largely free within the mediastinum without an attached blood supply. The removal then represents merely the freeing of the intrathoracic mass digitally from the surrounding condensed mediastinal tissue and pleura and the mechanical delivery of the tumor through the upper thoracic aperture.

Fig. 12.—An enormous multiple colloid adenomatous goiter with calcified shells, deep within the mediastinum.

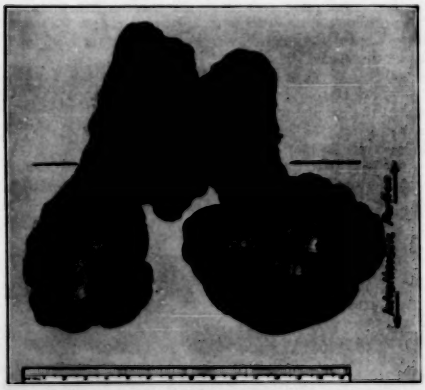

Fig. 13.—An intrathoracic goiter showing the extension of masses arising from the lower poles of the thyroid on each side, removed from the mediastinum.

Practically all intrathoracic goiters have definite capsules with semisoft centers, even though they are of the multiple colloid adenomatous variety of goiter. Exclusive of those intrathoracic goiters which are solid because they have acquired malignant characteristics of the carcinomatous variety, practically all intrathoracic goiters are amenable to being broken down in their centers. We have seen more than one patient who has had the inner half of the clavicles and the upper end of the sternum removed before coming to us, the operation having been given up because the intrathoracic mass was considered to be too large to be removable. In an experience now represented by approximately 700 operations for intrathoracic goiter, we have but three times found it necessary to remove the sternum in order to remove the intrathoracic mass. This number (700) includes only operations for goiters which have descended to or below the arch of the aorta. Roentgenograms (figs. 10, 11 and 12) and photographs (figs. 13, 14, 15 and 16) are shown of enormous intrathoracic goiters extending downward almost to the diaphragm which have been successfully removed without taking off the front wall of the chest. It is obviously impossible to deliver an intrathoracic goiter such as that shown in figure 1 through the upper thoracic strait, since its diameter in all directions is considerably greater than the diameter of this strait. Such a tumor could be removed only by increasing the diameter of the upper thoracic strait or by decreasing the diameter of the tumor. The procedure which we for several years have employed is one aimed at decreasing the size of the intrathoracic mass. Practically all intrathoracic goiters, once the prethyroid muscles are cut and turned down, are palpable at the upper end of the mass. A double hook of the type which we have modified for thyroid operations (fig. 17) is inserted into the upper end of the intrathoracic tumor. Another double hook is placed opposite this, and the upper end of the intrathoracic mass is then pulled well up into the superior thoracic strait. With a knife a slit is then made through the capsule in the top of the tumor. A finger is inserted into the center of the tumor and twirled about until the center is broken down. This can be done with but little bleeding, since the arterial and venous blood supply has

Fig. 14.—An intrathoracic goiter showing the spherical shape of a discrete adenoma removed from within the mediastinum.

been controlled. This partial collapse permits further elevation of the tumor into the superior thoracic strait. More of the central portion of the tumor is then broken down with the finger, thus permitting further delivery of the tumor into the upper thoracic strait. Further separation of the surrounding condensed mediastinal connective tissue and the pleura is carried out digitally until the tumor is entirely delivered.

Great care must be taken as the tumor is delivered from the mediastinum to free it carefully by digital manipulation from the pleura and the surrounding mediastinal tissue. This is easily done in most instances. There will, however, be occasional cases in which, as a result of inflammatory reaction, there will be dense adhesions between the pleura and the capsule of the adenoma. These must be carefully separated, and occasionally it is necessary, when a dense local area of

Fig. 15.—One lobe of the thyroid together with the intrathoracic mass successfully removed from the mediastinum. Note how impossible it would be to palpate the lower pole of this lobe, and note the spherical outline of the intrathoracic adenoma.

inflammatory reaction has occurred between the pleura and the capsule, to leave a small segment of the capsule attached to the pleura. It is infinitely better to leave attached to the pleura a small segment of the capsule of a very adherent adenoma than to risk the rupture of the attached pleura. One must be extremely careful in the removal of a deep intrathoracic mass not to break the tumor up but to remove it as a complete mass. If segments of the unvascularized tumor are left behind they may well slough and result in secondary infection and mediastinitis. One should also be extremely careful after the mediastinal mass has been removed to inspect the cavity with the direct vision light to make sure that there do not remain bleeding plexuses of veins on the attached pleura.

After the removal of a large intrathoracic thyroid mass, a large loose pack of gauze completely filling the cavity should be introduced and should remain within the cavity for a minimum of seven days. The cavity is certain to fill up with fluid and blood if unpacked, thus exposing the patient unnecessarily to the danger of infection and secondary mediastinitis.

We have frequently stated that one of the most important considerations after thyroid operations is when to do a tracheotomy, and we have condensed our

Fig. 16.—Prolongation of a multiple colloid intrathoracic goiter into the mediastinum. Note that multiple colloid adenomatous goiters becoming intrathoracic are less spherical than are discrete adenomas.

experience with this problem into the statement that, when one begins to wonder whether or not tracheotomy should be done, that is the time to do it for a patient having breathing difficulties after a thyroid operation. Provided the tracheotomy is done low enough in the trachea and provided the mediastinum has been well packed with gauze, there is little disadvantage to a tracheotomy at this time. As soon as the tube is removed the trachea will close and, provided the packing has been adequate, there will be but little danger of mediastinitis. After all, should there be sufficient interference with breathing one must accept the risk of mediastinal contamination with a tracheotomy or the risk of suffocation.

Fig. 17.—The double hook employed in the Lahey Clinic for grasping the thyroid. Note that when the jaws are closed, since they are flat, they serve as hemostats to control bleeding.

It has been our experience that after the removal of the intrathoracic masses the deviated and collapsed trachea soon resumes its normal caliber and its median position.

In the entire series of cases of intrathoracic goiter, including all types, the very deep, which have extended

nearly to the diaphragm, the malignant growths and those for which the anterior wall of the chest was removed, the mortality to July 1933 was 4.4 per cent; from July 1933 to the present time the mortality has been decreased to 1.7 per cent. It must be accepted when intrathoracic goiters have been permitted to extend so deeply into the chest that they are very close to the diaphragm and that the mortality will be higher than for operations for extrathoracic goiters, which again brings me to the point mentioned in the introduction to this paper. While the problem of the management of the intrathoracic goiter deals with its successful mechanical removal from the mediastinum, the really successful approach is through the prompt removal of all adenomas of the thyroid and adenomatous goiters that are becoming or tending to become intrathoracic.

SUMMARY

The types of goiter which become intrathoracic are discrete adenomas, cysts of the thyroid and multiple adenomatous goiters.

The mechanism of the descent of a goiter through the superior thoracic strait is related to the anatomy of the upper thoracic aperture.

The undesirable effects of intrathoracic goiter are the results of pressure on the trachea and the internal jugular veins.

The symptoms of intrathoracic goiter are largely related to these three factors.

The introduction of a rigid intratracheal tube before operation for intrathoracic goiter is necessary.

Large intrathoracic goiters can be extracted from the mediastinum without removing the chest wall if the proper procedure is followed.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. FOSS, HUNT AND MC MILLAN, DR. CRILE AND DR. LAHEY

DR. FREDERICK A. COLLER, Ann Arbor, Mich.: A great deal of attention has been devoted to the crisis that occurs after operation. There is a group of patients who have thyroid crises for whom something can be done, and that is the group that have their crisis before they reach the surgeon. In 1934 Ransom and Bayley analyzed the proved cases of thyroid crisis that had occurred in the medical and surgical wards of University Hospital, Ann Arbor. There was a definite group of patients that went into crisis because they came for treatment too late. Instead of compound solution of iodine, inadequate sedation was given to them. There was a group on whom we were unwise enough to operate for lesions other than the goiter. These were operations carried out on patients with minor degrees of hyperthyroidism that precipitated a crisis. We should not carry out any type of operation on patients with even mild degrees of hyperthyroidism unless those operations are designed to relieve the hyperthyroidism. Another group of patients developed crisis following infections of only moderate severity, such as tonsillitis, pyelitis, cholecystitis or thrombophlebitis. Another group of patients had a thyroid crisis precipitated by therapeutic and diagnostic procedures, such as thoracentesis, abdominal paracentesis, lumbar puncture or basal metabolic determinations; that is, these tests were carried on too soon after the patient got into the hospital. There was a last group of patients developing crisis who had inadequate sedation. They had had inadequate sleep or no sleep for eight successive nights. They had all been given sedatives of the usual type but no attention had been paid to the fact that these sedatives had not been effective. We do not know the cause of crisis but we can often prevent it by regarding hyperthyroidism of even a moderate degree as a severe disease that should have definitive treatment just as soon as we can make the diagnosis.

DR. JAMES H. MEANS, Boston: Thyroid storms are not necessarily postoperative. Other stimuli than operation can produce this peculiar and alarming reaction which thyrotoxic patients exhibit. Plummer claimed that a tendency to develop the type of reaction which we call storm or crisis is really one of the fundamental characteristics of exophthalmic goiter. He was accustomed to speak of "crisis status," a phase of the disease in which the patient at any moment was likely to be thrown into storm. Plummer's introduction of iodine in the routine care of persons with exophthalmic goiter has almost, but not quite, abolished this alarming complication. The etiology or the mechanism of storm is really unknown. We may say that a storm represents an acute failure of what Cannon has called homeostasis, the cause of the failure being excessive stress of any sort. Whether the stress is anoxemia, too much self-administered epinephrine, infection, or on the part of the patient, its effects can be looked on as a failure in the ability of the body to maintain an equilibrium in the face of a thoroughly pathologic metabolic setup. The crisis is characterized by an intensification of thyrotoxicosis, but probably more than any other one thing it is characterized by a very fulminating hyperthermia. I have lately become interested in observing the psychologic state of patients with toxic goiter. I agree with Dr. Coller that proper sedation should be employed. It is equally important that oversedation should not be allowed. You have to hit a happy medium. The best sedation for most of these patients is iodine. The remarkable thing is that iodine has a most astonishing effect on nearly every function of the body, including the emotional state, which characteristically becomes calmer. But if on iodine this doesn't happen, the patient bears watching. These are the ones who are likely to have a storm. Treatment of storm must be prompt, rapid and vigorous and includes oxygen, fluid and dextrose, and iodine. Actually during crisis a minimum of sedation should be used. But most important is a vigorous treatment of the hyperthermia. Persons with hyperthermia have to be packed in ice or bathed in ice water; cold packs or spongings merely are not enough.

DR. JAMES D. RIVES, New Orleans: I should like to add one to the numerous known causes of thyroid crisis so well described by Bayley. The human being is capable of adaptation to a tremendously wide variation in external temperature. Gessler has demonstrated that heat production is high in cold weather and low in warm weather. Eaton has demonstrated that the basal metabolism in subtropical countries is about 10 per cent lower than the usual standards. The hyperthyroid patient obviously cannot make this response to variation in external temperature. His salvation lies in an increase of heat elimination rather than a decrease in heat production. Rubner has shown in the dog that, as external temperatures increase, heat loss by evaporation increases from about 25 per cent at 70 F. to about 75 per cent at 95 F. The dog sweats only on his footpads and it is probable that in the human being, as stated by Du Bois, heat loss is almost entirely by evaporation when the external temperature reaches 95 F. New Orleans is an ideal place in which to show the effects of heat and humidity in the causation of thyroid crisis. The records of the local weather bureau show that the temperature from the first of May until the middle of October is consistently so high that a majority of heat elimination must take place by evaporation. They also show that the humidity is constantly so high that heat loss by evaporation is minimal. Obviously, this causes serious embarrassment of the heat regulating mechanism. I have collected cases of nonsurgical thyroid crisis in the Charity Hospital for a period of nine years, from 1930 to 1938. I found twenty-one cases of nonsurgical or spontaneous thyroid crisis, sixteen of these occurring in the five months from June to October inclusive. The incidence is greatest in the latter part of this period, owing, I believe, to the long continued exposure to high temperatures and humidities during the preceding months. It seems to me probable that, in countries where the temperatures are high but the humidities low, no serious harm would result. I do not intend to convey the idea that this is the only, or even the most important, cause of thyroid crisis, but I do believe that it is definitely a contributory factor.

DR. WILLARD BARTLETT JR., St. Louis: The point of view which says that the postoperative crisis, or the degree of postoperative reaction in general, develops in proportion to the amount of thyroid tissue left in the neck at the time of operation is wholly contrary to all experience. I know of no respectable weight of evidence for this point of view, but it seems to have achieved a certain amount of fashion. It is a highly dangerous point of view and if persisted in leads to numerous avoidable tragedies. It violates the principle that the degree of reaction is dependent on the amount of work done on the patient in any given situation in comparison with his ability to withstand whatever that planned procedure is. Please understand me, I am not decrying total thyroidectomy as a means of diminishing recurrence of hyperthyroidism but rather the performance of total thyroidectomy as a hopeful procedure in diminishing the severity of postoperative reactions. It should be clearly understood that the operative risk nowadays can be measured with mathematical accuracy and, as Dr. Coller's experience has shown in recent years, there have been considerably more deaths in crisis in patients preceding operation than after operation. So also we, since 1930, have had nearly three times as many deaths in thyroid crisis occurring in patients who were not operated on at all, but in whom crisis came on within a few hours to a few days of admission to the hospital, as we have had postoperatively.

DR. HAROLD L. FOSS, Danville, Pa.: Dr. Means refers to the importance of the patient's psychic state. While the mental condition of the patient with active hyperthyroidism must be closely observed and treated, the patient does not die from a mental disturbance alone. Crisis depends on something far more tangible and, one might say, more organic. We who work in large thyroid clinics have all observed the obvious nervousness which is so cardinal a part of the syndrome of exophthalmic goiter, yet, once the confidence of the patient is secured, he is usually found to be a person of rather unusual fortitude. While excessively nervous he is yet not "neurotic" and is usually clamorous for relief and faces the operation with unusual courage. While the psychic phases of the problem are important, that unknown something occurring within the organism in which disturbances of thyroid physiology plays the major role is one of the riddles of modern medicine. The increase in metabolism must be tremendous. No one has ever accurately determined it. The hyperorexia, uncontrollable delirium and uncountable pulse are all part of the picture, the exciting factor of which is yet unexplained. Postoperative crisis in classic exophthalmic goiter is now rare. It was common twenty years ago and accounted for many deaths. We worry but little today over the possibility of impending postoperative storm in the young woman with typical exophthalmic goiter of but a few months duration. Such states are readily controllable today, yet the same condition caused great concern a generation ago. We have today under consideration the patient past 60 with associated arteriosclerosis, cardiovascular and other visceral degenerative changes incident to advancing years and who gives a history of having had a goiter "since a girl" or for "many years," the patient who has frequently had interminable iodine medication or has been subjected to various forms of bizarre, therapeutic vagaries in an attempt to relieve her of her "heart disease" or whatnot without the true nature of the situation being understood. These are the patients who, years after the appearance of a goiter, develop, insidiously, symptoms of hyperthyroidism and who, within thirty-six hours following operation, suddenly and unexpectedly plunge into a state of crisis from which many never recover. Oddly enough, nothing is found on postmortem examination other than myocardiovascular changes incident to senility to account for the rapidly advancing crisis. Dr. Rives's ingenious meteorological explanation for crisis is interesting. I feel, however, that the patient who is to develop postoperative thyroid crisis, everything else being equal, will about as readily have it in the arctic as he will in the tropics. There is no more unexplained phenomenon than hyperthyroid crisis and the curious thing is after years of intensive study of the thyroid and the thousands of postmortem examinations, so little has been contributed to the exact knowledge of its mechanism.

TRAUMATIC EPIDIDYMO-ORCHITIS

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Owing to the mobility of the testicles, as well as to their adequate scrotal coverings and their location between the fleshy parts of the thighs, injury to them is relatively infrequent. That many persons receive injuries for which they do not seek medical aid is no doubt true.

Several cases of traumatic epididymo-orchitis have come under my observation. Most of the patients were young adults, the youngest a boy of 12. Several varieties of trauma were involved, baseball injuries being the most common. Injuries from wrestling and from striking the handles of lawn mowers were observed. For the most part, the injuries I have seen have been of no unusual moment. None required any type of surgical intervention. I have been able to observe only a few patients at periods after the injury; in none did atrophy of the testicle occur. However, this complication is not uncommon after such injuries.

I observed one instance of laceration of the scrotum in which the testicle was hanging outside the scrotum when the patient was admitted. No complications followed surgical closure of the wounds.

Wesson [1] observed that college athletes seldom have traumatic orchitis but occasionally suffer from epididymitis caused by infection. A medical colleague, Dr. Walter Meanwell, a basketball coach and athletic director of many years' experience, informs me that such injuries seldom occur in the larger schools during intercollegiate contests, owing, in his opinion, to the fact that the athletes are provided with adequate protection (some type of heavy suspensory). But in intramural and interfraternity athletics, for which this protection is not provided, he has observed several such injuries, one that he could recall being followed by complete atrophy of the testicle and another by rupture of a testicle with the formation of a hematoma, requiring the removal of the testicle.

I wish to devote most of my discussion to those cases of epididymitis or epididymo-orchitis in which examination provides evidence of inflammation and in which an alleged trauma, either direct or indirect (the so-called strain), is supposed to have been a contributing factor. Such cases are important because the majority of them occur in working men and the question of compensation almost always arises.

I believe that the pertinent question is not whether trauma can initiate epididymo-orchitis or light up some dormant pathologic condition but whether direct trauma or strain can precipitate a clinical attack of epididymo-orchitis.

Wesson stated that "an epididymitis is secondary to a urethritis or seminal vesiculitis, and its occurrence depends on the virulence of the organism and the susceptibility of the patient, the extension to the epididymis inevitably appearing regardless of whether the patient is confined to bed or receives a blow on the testicle."

Crane [2] discussed the mechanism of the development of epididymitis and stated that under the conditions enumerated an infection of the epididymis is almost

From the Jackson Clinic.
Read before the Section on Urology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. Wesson, M. B.: Traumatic Orchitis a Misnomer, J. A. M. A. **91**: 1857-1861 (Dec. 15) 1928.
2. Crane, J. J.: Epididymo-Orchitis in Industrial Surgery, J. Urol. **34**: 477-479 (Nov.) 1935.

sure to occur spontaneously without being associated with trauma. When occurring in a working man, immediately some minor injury in the form of a strain or blow is easily recalled and given credit for the sudden onset of the epididymitis, when in reality the sudden strain or minor blow simply caused the patient to realize that an inflammatory process existed.

From my clinical experience, I find that I must disagree with these opinions. However, I agree with the reports as to the nature of the pathologic process found. Under the circumstances, I believe a brief review of the mechanism of the development of epididymitis is pertinent.

Rolnick,[3] who has studied this problem extensively, states that most infections of the epididymis are secondary to infections of the seminal vesicle, extension of the infection along the lumen of the vas deferens being the mode of involvement.

Hematogenous infections occur in a small percentage of cases.

The vesicles may be infected as the result of passage of bacteria from the epididymis through the vas deferens, since the epididymis has the power to excrete bacteria.

The chronic infections of the epididymis, other than tuberculosis, which are frequently seen and termed simple or nontuberculous inflammations, are probably, in the vast majority of cases, of hematogenous origin.

As a result of inflammatory edema about the verumontanum, the ejaculatory duct becomes temporarily occluded. Plugs of pus or mucus also may produce blockage of the ducts. The infected seminal vesicle and ampulla become distended with pus and, being unable to escape through the duct, the pus finally regurgitates through the lumen of the vas to the tail of the epididymis. As a result of active peristalsis of the vas deferens (no reverse peristalsis has been proved to exist) the organisms and pus will be propelled backward with each peristaltic wave of the vas toward the posterior portion of the urethra, the mechanism here being similar to bladder reflux. The infection does not spread by continuity along the mucosa of the vas from the urethra, because the spread is too rapid. Neither can it travel along the lymphatics, for there is no continuous chain of these along the vas to the epididymis.

Kreutzman[4] states that viable organisms may be present in the vas without causing any symptoms or producing any gross changes. Epididymitis following ligation of the vas is due to a lighting up of a previous vasal infection and not to an infection of the lymphatics or blood stream. Vasitis and epididymitis occur only in the presence of infected urine. Under certain conditions not yet understood, reflux of urine may occur into the vas as it does into the ureter. When the urine is infected, instrumentation doubles the possibility of epididymitis. Chronic prostatitis alone will not cause vasitis or epididymitis.

O'Conor[5] observed in two cases of prostatic obstruction that silver solution injected into the bladder was found in the vas deferens less than twenty-four hours after instillation.

I have reviewed many of my cases of epididymitis and in every instance found evidence of infection in the form of pus and, in many instances, of organisms obtained on culture of urine from the second glass. I think, then, that it is only reasonable to assume that trauma in the form of a severe strain could force infected material along the vas to produce acute epididymitis.

In the older textbooks and articles may be found the statement that the male urethra will harbor different strains of bacteria which, "though usually nonpathogenic, may be come pathogenic under various stimuli." In this connection, the following case is of interest:

Case 1.—A. W., aged 23, fell several feet and straddled a rail on a loading platform. He suffered acute pain in both testicles and for some time was unable to continue his work. He came to the clinic three days later (December 1932), at which time the left epididymis and testicle showed swelling graded 1. There was discoloration of the scrotum. Rest and support were advised.

Several days later he noted a urethral discharge; there was no dysuria. He stated that there had not been any previous gonorrheal infection. Examination disclosed a urethral discharge, smears of which showed pus cells and gram-negative bacilli. Cultures were reported as showing Bacillus coli. Both glasses of urine were cloudy; the second showed pus, motile bacilli and a few blood cells. Cultures of urine from the second glass showed B. coli. The left epididymis still showed enlargement graded 1 and was tender. The left testicle was, by this time, normal. The prostate was of normal size, and examination of the fluid gave negative results on several occasions. Repeated examinations of the urethral discharge revealed no organisms except gram-negative bacilli. With local treatments, the urethral discharge subsided seventeen days after the injury. Here, then, was a typical case of traumatic epididymo-orchitis in which urethritis due to colon bacilli developed, undoubtedly precipitated by the trauma.

If all cases of epididymo-orchitis I observe were as indefinite as to trauma or the so-called strain as the following, they would not cause me so much concern. I would be inclined to the view that the epididymitis occurs as a coincidence and is in no way precipitated by the alleged physical exertion. Certainly this patient's routine work required as much physical exertion as the spading in the garden, the alleged physical exertion:

Case 2.—C. D., aged 57, a garage operator, came to the clinic in May 1938 on account of pain and swelling of the left testicle of three days' duration. One afternoon after spading in his garden he had noted soreness and pain in the left side of the scrotum. The next day there appeared in the left testicle swelling and pain, which gradually became worse. There were no urinary symptoms and no history of a previous similar difficulty; he stated that he had not had gonorrhea.

Examination disclosed a urethral discharge, smears of which showed gram-negative bacilli and gram-positive cocci. There were no organisms that resembled the gonococcus. The second glass of urine contained pus graded 1, red blood cells graded 2 and motile bacilli. Cultures showed B. coli.

There were epididymo-orchitis on the left graded 2 and funiculitis graded 2. The prostate showed enlargement graded 1 and was boggy; the fluid contained pus graded 1, stained smears of which showed no definite organisms. There was no residual urine. There were an inguinal hernia on the right, for which he wore a truss, and a small left direct hernia.

However, this is not the type of case that leads me to believe that trauma as previously defined can and does precipitate an attack of acute epididymitis in the patient who harbors chronic prostatovesiculitis or infected urine. Such a case may be the following:

Case 3.—H. N., aged 27, came to the clinic in July 1932 complaining of pain and soreness in the left groin and pain and swelling of the left testicle. Five days previously, while he was stepping into his car, a dog jumped on him and in his haste he struck his left groin and the left side of the scrotum on the edge of the car door. The next day, on account of the

3. Eisendrath, D. N., and Rolnick, H. C.: Urology, ed. 4, Philadelphia, J. B. Lippincott Company, 1938.
4. Kreutzman, H. A. R.: Studies of Injections of the Vas Deferens, J. Urol. 39: 123 (Feb.) 1938.
5. O'Conor, V. J.: Silver Solution in the Lumen of the Vas After Bladder Instillation, J. Urol. 33: 422-425, 1935.

swelling and pain which came on soon after the accident, he consulted a physician, who advised rest and cold compresses. The history disclosed that he had had uncomplicated gonorrheal urethritis four years previously.

There was no urethral discharge. The urine was normal. There were subsiding ecchymosis in the region of the left groin and some swelling. The left epididymis showed swelling graded *2* and was painful. The left testicle was swollen and painful. The prostatic fluid contained pus graded 1, smears of which showed gram-positive cocci and gram-negative bacilli; the fluid was not cultured. The patient left my care seventeen days after I first saw him, at which time the globus major showed enlargement graded 1 and was hard and painful. Four months later he wrote me that a hard swelling had developed next to the left testicle. He was advised to consult a urologist in his city. The insurance company refused liability on account of the history of gonorrhea. This man undoubtedly had trauma followed soon by pain and swelling of the epididymis and testicle, traumatic epididymo-orchitis, yet at the time I saw him the lesion was, in my opinion, of an inflammatory type.

The two following cases are typical of the ones I had in mind when I prepared this discussion:

CASE 4.—D. L. S., aged 52, had been a patient at the Jackson Clinic since 1927. In July 1937 he came for a physical examination and stated that at times he had frequency of urination. The prostate was normal in size; the fluid contained pus graded 1. The urine was alkaline and contained pus graded 1 and motile bacilli. There was no residual urine. He was given a bladder instillation of 5 per cent mild protein silver solution and methenamine and sodium acid phosphate by mouth. At subsequent visits he did not complain of the frequency and he did not report for further observation. His history disclosed a gonorrheal infection at the age of 20.

July 22, 1938, while he was assisting in assembling a combine mower, the full weight of the machine was thrown on him for a few seconds, requiring great physical exertion. July 24, two days later, he noted an ache low in the back on the right; the next day he had pain in the right testicle, frequency and some weakness of the urinary stream. When seen July 26, four days after the physical exertion, he complained of pain and swelling of the right testicle, frequency and dysuria.

Examination disclosed tenderness over the right iliac joint and epididymitis on the right graded *2*. The prostate was boggy and the fluid contained pus graded 4, smears of which showed no organisms resembling the gonococcus. Cultures showed B. coli. The second glass of urine showed pus graded 4 and red blood cells graded 1; the cultures showed B. coli. Two days later the temperature was 102 F. and there were epididymitis on the right graded 4, orchitis on the right graded *2* and funiculitis graded *2*. There was marked thickening of the vas. Funiculitis and vasitis were not present at the time of the first examination. Thirty-five cc. of hazy hydrocele fluid was aspirated.

There was evidence that this patient had infected urine and low grade prostatitis one year previously, although during the interval he could not recall having had any local symptoms. He was given sulfanilamide; rest, heat and support were employed, and the acute process rapidly subsided.

The prostate was massaged at weekly intervals, and 5 per cent mild protein silver solution was instilled in the prostatic portion of the urethra with a No. 8 French soft rubber catheter. After a series of eight or ten such treatments the prostatic fluid showed only a few pus cells and the urine had appeared normal microscopically and on culture for several weeks. Treatments were discontinued for a month, and then examination disclosed pus graded *2* in the prostatic fluid. The next day, after the second treatment, he noted frequency and dysuria and pain in the side of the sacral region. The next evening these symptoms persisted, and while attempting to open a storm window by pushing with his foot, he slipped and fell, impinging his scrotum between his buttocks and the floor. There was acute pain in the scrotum, which lasted for some time, followed by dull pain. The next morning the scrotum was swollen and painful. Examination disclosed epididymitis on the left graded *2* and pus in the second glass. In the latter instance the epididymitis would certainly have developed, but in my opinion it was hastened and aggravated by the physical trauma.

CASE 5.—E. C. J., aged 33, an attorney, was admitted in March 1937 on account of fever, pain and swelling of the right testicle. The history disclosed that on a Saturday he had lifted a heavy box of books requiring unusual physical effort. He was not aware at the time of any pain. On the Monday following he noted pain in the right side of the back and the right loin, with radiation to the right testicle. Within a few hours after the onset of the pain in the loin he noted constant pain in the right testicle, followed soon by swelling of the testicle. On this day he had definite rigor followed by fever. There was no history of recent acute illness such as grip or coryza and no history of previous urinary symptoms except that in 1935, after an appendectomy and while still in the hospital, he had an attack of what his physician thought was renal colic on the right side. His history disclosed that he had had uncomplicated gonorrheal urethritis six years previously.

Examination disclosed a mucoid urethral discharge, which on smear showed gram-negative bacilli and gram-positive cocci. Both glasses of urine were cloudy; the second contained pus graded 4. The cultures showed staphylococci and B. coli. The prostate was boggy; no fluid was expressed at this time. Twenty days later a smear of the prostatic fluid showed gram-negative bacilli and, on culture, B. coli. An original roentgenogram revealed no evidence of calculi. There were tenderness over the right renal area, epididymitis on the right graded 3 and orchitis graded 1. Five days after admission, the right epididymitis was incised from pole to pole. No frank suppuration was found; the cultures showed B. coli from two separate areas. The pathologic diagnosis was acute and early suppurative epididymitis with no evidence of tuberculosis or neoplasm.

The attack of pain which the patient had while in the hospital after the appendectomy was probably due to pyelonephritis, and no doubt he had residual prostatitis.

I frankly admit that such cases do not prove or disprove the role of the sustained "strain" in precipitating the attacks of epididymitis; neither do my observations lead me to believe that the attacks described would have occurred had the men been confined to bed.

I think that one should attempt a proper evaluation of all factors concerned in a given case. It is to be noted that the traumas or strains under consideration in the cases I am discussing were of a definite nature, and I would not consider any which were not.

The two following cases are of interest in that the same type of trauma or strain was alleged in the two instances and in both the question of compensation arose:

CASE 6.—J. J. S., aged 52, a meat cutter, came to the clinic in July 1935 complaining of pain and swelling of the right testicle of several days' duration. Nine days previously, while he was carrying a quarter of beef, his foot slipped and immediately he experienced sharp pain followed by discomfort in the right inguinal region. The next day he noted some swelling of the right testicle and he began wearing a suspensory, which afforded him some relief. The day before admission, after an automobile ride, the pain became much worse and the swelling increased. There were no urinary symptoms and no urethral discharge. There was no history of gonorrhea. The right epididymis showed swelling and tenderness graded *2*; the right testicle, swelling graded *2* and tenderness. The prostate was slightly enlarged and firm; the fluid contained a few pus cells but after several examinations was graded as to such cells less than 1. The urine showed pus graded *2* in clumps, many motile bacilli and, on culture, B. coli. With appropriate treatment, the process subsided in nine days.

CASE 7.—E. K., aged 42, a meat cutter, was seen at his home Dec. 11, 1936, on account of redness of the scrotum, pain and swelling of the left testicle and fever. The history disclosed that on Thanksgiving day, while he was attempting

to place a quarter of beef on a block, his foot slipped and he experienced sharp pain in the left groin. He sat down for a while but the discomfort in the groin continued, and about December 7 pain and swelling of the left side of the scrotum was noted, having gradually increased. When I saw him December 14 there was epididymitis on the left graded 2; the vas was thickened and infiltrated throughout its palpable length. The prostatic fluid contained pus graded 4; several stained smears failed to reveal gram-negative diplococci. The second glass of urine contained pus graded 1 in clumps and motile bacilli. The history disclosed that the patient had had gonorrhea five or six years previously.

Again I must admit that the trauma (strain) as a factor in precipitating these lesions was questionable, but neither can I admit that the trauma served only to call the patient's attention to a pathologic process that was already in the act of developing. Had the pathologic process been tuberculosis, tumor or a gumma, then I could easily have seen that this was the case.

Some writers speak of the ease with which gonococci are found in the seminal fluid, prostatic fluid and urine by smear in such cases. I have not found it easy to demonstrate them. However, my efforts have been confined to a study of stained smears of the seminal and prostatic fluid and urinary sediment, since facilities for culture of the gonococcus are not at my disposal, and perhaps the interval between the infection and the development of epididymitis was too long.

In the following case I made repeated smears in searching for the gonococcus, because the history disclosed that the patient had had a gonorrheal infection four years previously with no complications and no recurrence of the discharge:

Case 8.—B. P., aged 41, came to the clinic in March 1936 complaining of pain and swelling of the right side of the scrotum of several days' duration. Two days after heavy physical exertion sustained while pushing an automobile from a snow drift, he noted pain in the lower right abdominal quadrant and the right inguinal region. It did not disable him, but the day after he noted pain and swelling in the right side of the scrotum. The general examination gave negative results except to disclose a temperature of 101 F. The right epididymis was acutely tender and showed swelling graded 3. The urine contained pus graded 4. The prostate showed enlargement graded 1 and was boggy and tender, and the fluid contained pus graded 4; several smears revealed no gram-negative diplococci.

With support, heat and rest, the pain, swelling and temperature gradually subsided. Six days after his first visit he was awakened in the early morning with a dull aching pain in the right lower quadrant which remained constant. When he was seen during the day there was some tenderness on palpation along the inguinal canal and in the right lower abdominal quadrant. The swelling in the epididymis was subsiding except in the upper pole, which still showed swelling graded 2 and was tender. There was crepitation in the tunical structures. The prostate was smaller than at the previous examination. The urine contained clumps of pus and motile bacilli. Rest and heat were advised. About 10 o'clock that night he was seen again on account of severe pain in the right lower quadrant radiating to the back, the right renal region and the loin. The temperature was 103 F. There was no frequency or dysuria.

Examination revealed tenderness over the right renal area and marked tenderness just above the middle of Poupart's ligament on the right. The epididymis was as in the morning. The vas, as far as it could be palpated, was about the size of a pencil and very tender. The prostate and right seminal vesicle were boggy but not appreciably enlarged or tender. The diagnosis was acute pyelonephritis (on the right) and probably some degree of ureteral stasis due to edema and swelling of the vas. Hot sitz baths and hot rectal irrigations promptly relieved the pain on the right side and pain on the right renal region. The patient was subsequently treated by the usual methods for his infection of the prostate and the urinary tract.

A review of several of the cases under discussion reveals that vasitis and funiculitis developed several days after the onset of the epididymitis, suggesting that the vas was involved by infected material forced into its lumen from above; the vas is more resistant to infection than the epididymis, and thus the delay in the development of the vasitis. Or else the vas was involved by extension of the inflammatory process from the epididymis.

Whether direct trauma such as a blow could predispose to the localization of bacteria from some other focus of infection is another interesting and debatable question.

Buckingham,[6] in his discussion of nonspecific metastatic epididymitis, observed that such lesions are seen most often after infections of the upper respiratory tract, after acute and chronic coccic infections or in the course of any disease in which bacteremia may arise. He further stated that there is a little doubt that slight trauma to the scrotal contents during the course of any acute infection tends to lower the threshold of resistance of the tissues and predisposes to the localization of the infection in the epididymis and that the primary focus could continue to feed the damaged part. He also stated that during the course of any twenty-four hours there are undoubtedly a few cocci circulating in the blood stream of many healthy persons. A coupling of this with trauma at the correct time might account for some of the infections in which the primary focus is not demonstrable. He also stated that trauma undoubtedly plays an important though secondary part in all infections of the genito-urinary tract.

It is evident that such statements are merely theories, but in my opinion they are plausible theories.

For the sake of brevity, I shall report only one case in which direct trauma was, I believe, the precipitating factor in lighting up a dormant epididymal infection, although I have observed other such cases. Had the patient received a blow from a pick or shovel handle while at work, I am sure the same process would have been precipitated.

Case 9.—H. W., aged 65, was sent to the clinic from the county dispensary in September 1933 on account of pain and swelling in the right side of the scrotum and pyuria; there were no vesical symptoms. He had undergone a suprapubic prostatectomy five years previously. During convalescence, epididymitis developed on the right side, followed by a hydrocele, which was tapped several times. Several days prior to admission, while he was playing with or holding his grandchild, the child accidentally kicked him on the scrotum. After the kick there was severe pain in the scrotum, and the next day there were swelling and fever. He was confined to bed for a few days. Examination disclosed a hydrocele on the right, from which 150 cc. of turbid fluid was aspirated. The epididymis showed enlargement graded 1 and was hard and extremely tender. After the acute reaction had entirely subsided, the hydrocele was treated by the injection method.

CONCLUSIONS

Traumatic epididymo-orchitis is a distinct clinical entity, and cases coming under medical observation are relatively infrequent.

My experience leads me to believe that clinical attacks of inflammatory epididymo-orchitis can be precipitated by trauma either direct or indirect (the so-called strain). In the one instance the direct trauma serves to light

6. Buckingham, W. W.: Nonspecific Metastatic Epididymitis, J. Urol. 31:87-101, 1934.

up a dormant infection or, by lowering the threshold of tissue resistance, invites infection from some distant focus, and in the other the strain serves to force infected material such as urine, prostatic fluid or seminal fluid along the lumen of the vas to the epididymis.

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ABSTRACT OF DISCUSSION

DR. MILEY B. WESSON, San Francisco: This paper is based on a false hypothesis contrary to the laws of physiology and mechanics, that intra-abdominal pressure from a strain squeezes infected urine into the seminal vesicles and the ejaculatory ducts and that the pressure on the seminal vesicles causes their infected contents to backfire into the epididymis. The effect of intra-abdominal pressure on the seminal vesicles is negligible compared to the passage of a scybalum, which is known frequently to cause spermatorrhea but never epididymitis. Constipation is potentially a greater source of danger than the strain of lifting. Orgasm without ejaculation is a not uncommon complaint in cases of seminal vesiculitis and yet neither causes epididymitis. I question that the male urethra harbors nonpathognomonic organisms that become pathogenic under proper stimulation. John Hunter lost an argument of that kind when he inoculated himself from a urethral discharge and developed syphilis instead of gonorrhea. The doctrine of "latent infection" is intriguing, and we are all familiar with typhoid carriers and the fact that tetanus spores have been found in the scars of shrapnel war wounds, but nowhere could I find an authoritative statement to the effect that pyogenic organisms could live and multiply in an epididymis or any other apparently normal tissue. Autopsy surgeons make sections of the various organs as a routine, and although they frequently report prostatitis they never find organisms in a supposedly healthy epididymis or vas. Epididymitis is due to infection by organisms from the seminal vesicles. How long they are en route, we do not know. There may be an intervening vasitis and the host will probably complain of a "hernia from lifting." After the invaders have taken over the epididymis there is an incubation period before there are any subjective or objective symptoms; consequently these may develop while he is in bed. It is contrary to the precepts of bacteriology to have the entire process take place coincidentally with a strain or within a few hours afterward. If certain isolated statements are separated from the qualifying context and quoted as authoritative, they will prove to be pernicious and of far reaching deleterious effect to private practice because of the medicolegal importance of the subject. Furthermore, unless we check the tendency to make trauma again the universal etiologic agent, we are going to witness shortly the beginning of the end of the private practice of medicine.

DR. EDWARD CATHCART, Detroit: It is apparent that it is about as safe to discuss traumatic epididymo-orchitis as to discuss religion. You either believe in it or you do not. The thing that impresses me about this discussion is that it is not a medical problem; it is an insurance problem. Our treatment, whether trauma is alleged to be the cause or whether straight infection is alleged to be the cause, is the same. Our annoying obligation is to the injured person if he is injured and to the insurance company if it is not liable. It would appear that our approach to the clinical evaluation of these cases is one of overreaching. I believe the difficulty does not lie with our opinion as to whether epididymo-orchitis is traumatic or not; it is a matter of how insurance contracts are drawn. It has been increasingly easier to be a referee in this group in the past several years in Detroit because of the ability that we now have to allege that epididymo-orchitis is a compensable illness and not an accident. I think that our efforts, so that we may do reasonable and justifiable service both to the complainant and to the insurance company, calls for further cooperation in the more careful drawing of contracts. It is an unimportant medical problem but a very important insurance problem.

DR. GEORGE H. EWELL, Madison, Wis.: I have had great pleasure in the last year and a half corresponding with Dr. Wesson about this paper and about his views on this subject.

EXPERIMENTAL AND CLINICAL GRANULOMA INGUINALE

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Many investigators have asserted that they have cultured an organism comparable to the Donovan body on a variety of mediums, particularly Sabouraud's.[1] However, the types of organisms cultivated by the various investigators have not been identical. Moreover, subcutaneous inoculation of such organisms into human beings has failed in every instance to reproduce the typical lesions of granuloma inguinale.[2] It is therefore doubtful that the etiologic agent of this disease has ever been cultivated. On the other hand we have on several occasions aspirated material from unruptured inguinal abscesses (pseudobuboes) of granuloma inguinale in which the sole micro-organism present was the Donovan body. In attempting to corroborate the observations of previous investigators we met with utter failure to cultivate the Donovan body or any other organism from this material.[3] Since a pure culture of Donovan bodies was contained in the aspirated pus, we felt that some light might be thrown on the controversial issues concerning the causal agent of granuloma inguinale if subcutaneous injection of this material could be followed by exact clinical reproduction of the disease as well as recovery of the organism again in pure culture.

PUS FROM A PSEUDOBUBO CONTAINING DONOVAN BODIES IN PURE CULTURE

CASE A.—S. W., a Negro woman aged 24, was readmitted to the University Hospital with pulmonary tuberculosis and coincident granuloma inguinale of the perineum (proved by smears and biopsy). While she was hospitalized and under observation an indurated inguinal swelling appeared some three months after admission (fig. 1). This gradually ripened in two weeks into a fluctuating abscess (fig. 2). Ito-Reenstierna, Frei and blood Wassermann reactions were negative. The abscess was aspirated and only Donovan bodies could be demonstrated in smears. Culture of the pus on a variety of mediums failed to yield any growths. Ulceration of the pseudobubo followed

From the University of Georgia School of Medicine.
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Read before the Section on Dermatology and Syphilology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. These investigators include:
Aragao, H., and Vianna, G.: Pesquizas sobre o granuloma venereo, Mem. do Inst. Oswaldo Cruz **5**: 211, 1913.
Walker, E. L.: The Etiology of Granuloma Inguinale, J. M. Res. **37**: 427 (Jan.) 1918.
Goldzieher, Max, and Peck, S. M.: Granuloma Inguinale, Arch. Dermat. & Syph. **14**: 14 (July) 1926.
DeMonbreun, W. A., and Goodpasture, E. W.: Further Studies on the Etiology of Granuloma Inguinale, Am. J. Trop. Med. **13**: 447 (Sept.) 1933.
Castellani, Aldo, and Mendleson, R. W.: Remarks on the So-Called Cultures of Donovan Bodies, J. Trop. Med. & Hyg. **32**: 148 (June) 1929.
Randall, A.; Small, J. C., and Belk, W. P.: Granuloma Inguinale, Surg., Gynec. & Obst. **34**: 717 (June) 1922.
D'Aunoy, Rigny, and Von Haam, Emmerich: Pathology of Granuloma Inguinale, Am. J. Path. **14**: 39 (Jan.) 1938.
2. Reported by:
Gage, I. M.: Granuloma Inguinale, Arch. Dermat. & Syph. **19**: 764 (May) 1929.
McIntosh, J. A.: The Etiology of Granuloma Inguinale, J. A. M. A. **87**: 996 (Sept. 25), 1926.
DeMonbreun, W. A., and Goodpasture, E. W.: Further Studies on the Etiology of Granuloma Inguinale, Am. J. Trop. Med. **13**: 447 (Sept.) 1933.
Walker, E. L.: The Etiology of Granuloma Inguinale, J. M. Res. **37**: 427 (Jan.) 1918.
Lynch, Kenneth M., in discussion of McIntosh.[2]
3. Dienst, R. B.; Greenblatt, R. B., and Sanderson, E. S.: Cultural Studies on Donovan Bodies, J. Infect. Dis. **62**: 112 (Jan.-Feb.) 1938.

about ten days later exhibiting typical raised red granulation tissue. The lesions responded slowly to therapy (fig. 3). A small slightly tender lymph node in the right inguinal region was palpable at this time. It was excised along with two smaller lymph nodes for microscopic study.

Fig. 1 (case A).—Granuloma inguinale of perineum and vulva. One year after onset, indurated swelling in left inguinal region appeared.

THE EXPERIMENTAL PRODUCTION OF GRANULOMA INGUINALE

EXPERIMENTAL CASE 1.—Some of the aspirated pus from the pseudobubo in case A was inoculated subcutaneously into both groins and the left thigh of another tuberculous patient (H. G.). What followed is outlined in the accompanying table. Donovan bodies were recovered on the thirty-third and forty-third day respectively from the left (fig. 4) and right inguinal

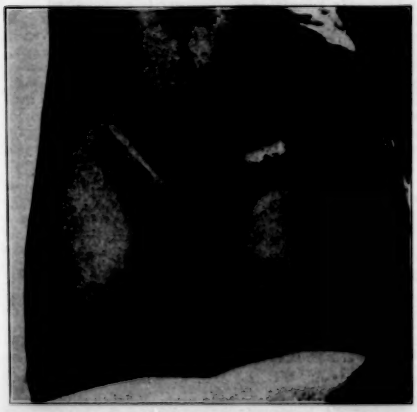

Fig. 2 (case A).—Fourteen days later: fluctuating inguinal abscess (pseudobubo of granuloma inguinale).

abscesses to the exclusion of other micro-organisms as proved by culture. Suffice it to say that the classic picture of the disease was reproduced in about fifty days (fig. 5). Since the lesion responded very slowly to therapy, surgical excision of the lesions along with several small inguinal nodes was undertaken on the eighty-fourth day.

EXPERIMENTAL CASE 2.—A piece of tissue, rich in Donovan bodies and containing relatively few secondary bacteria, was transplanted from an open lesion of granuloma inguinale to the right groin of a volunteer Negro man (R. H.) aged 35. Twenty days later a small indurated nodule appeared in the groin. On the forty-fourth day a fluctuating inguinal abscess was present (fig. 6 *a*). Aspiration yielded a few cubic centimeters of blood-tinged pus rich in Donovan bodies but no bacteria, as proved by further cultural studies. A classic picture of inguinal granuloma soon followed (fig. 6 *b* and *c*).

EXPERIMENTAL CASE 3.—F. H., a Negro volunteer aged 34, was inoculated subcutaneously in the groin with 0.5 cc. of exudate abundant in Donovan bodies and no bacteria. In three weeks a small swelling about 0.5 cm. in diameter was noticed at the site of inoculation. In five weeks the swelling increased to about 3 cm. in size. At this time some bloody exudate was aspirated and examined and Donovan bodies were found in large numbers. No bacteria developed when some of the exudate was inoculated into blood agar slants and Sabouraud's medium.[3]

EXPERIMENTAL CASE 4.—Pieces of tissue from lesions of granuloma inguinale were transplanted into each groin of a Negro woman (M. McC.) aged 18. Twenty-one days later

Fig. 3 (case A).—Two months later: inguinal and perineal granulomas responding slowly to therapy.

small indurated nodules appeared. After the twenty-sixth day these began to subside and no lesions have developed to this day, more than one year afterward. Mention however must be made that this patient was schizophrenic and received a series of intravenous injections of metrazol during the interval of this experiment.

Numerous investigators have unsuccessfully tried to induce experimental lesions in human beings by inoculation of cultures of micro-organisms cultivated from the human lesions. DeMonbreun and Goodpasture isolated a gram-negative bacillus belonging to the aerogenous group with morphologic characteristics of the Donovan bodies. They failed to induce granuloma inguinale by subcutaneous inoculation of such cultures in a group of six human volunteers. Working with human tissue rich in Donovan bodies they were, however, able to produce by repeated inoculation abortive infections in Macacus rhesus. McIntosh successfully transferred the disease from one individual to another by transplantation of tissue. However, Campbell [4]

4. Campbell, M. F.: Etiology of Granuloma Inguinale, Ann. J. M. Sc. 174:670 (Nov.) 1927.

criticized the deductions from such an experiment since the tissue was from an open infected lesion and must have carried other organisms with it. The role played by some symbiotic organism could not be ruled out. On the other hand the experimental production of granuloma inguinale by using the exudate from an unruptured pseudobubo which contained no other demonstrable organism obviates any similar criticism as that directed at McIntosh's experiment. In his two cases McIntosh determined the incubation period as forty-seven and forty-two days respectively. It is apparent from our cases that it is difficult to determine exactly when the disease begins. It is well to remember that individual susceptibility varies, for in one of our patients the disease failed to develop.

THE CONCEPT OF THE PSEUDOBUBO OF GRANULOMA INGUINALE

The bubo has been defined as a suppurative adenitis. Buboes are seen with marked frequency in venereal lymphogranuloma and chancroid disease, often in syphilis, rarely in gonorrhea.[5] In the aforementioned group the subacute inguinal adenitis is always secondary to a

Fig. 4 (case 1).—Experimental production of granuloma inguinale, thirty-third day.

primary focus in the genital zone. Is the inguinal lesion in granuloma inguinale a primary one? With what frequency does the inguinal lesion accompany one on the external genitalia? How often is the classic bourgeoning inguinal granulomatous ulceration preceded by a localized indurated swelling or fluctuating abscess in the inguinal region which simulates a bubo prior to rupture or incision? (fig. 7). These points seem to have escaped the scrutiny of most authors on granuloma inguinale and certainly deserve further elucidation.

In reviewing our own series of cases we were struck by the frequency with which the inguinal lesion was preceded by a primary focus on the genitalia (figs. 1, 7 and 8). Poindexter[6] noted that in patients with granuloma inguinale "frequently an operation for inguinal adenitis (buboes) was performed which did not heal." In the two cases of inguinal swelling reported by Gruhzit[7] there was an inguinal swelling in one which was incised, in the other there was one which was pricked, and in both healing did not follow. In case six reported by Goldzieher and Peck they mention that "the primary lesion was a small pimple adjacent to the urethral opening, which appeared three weeks after

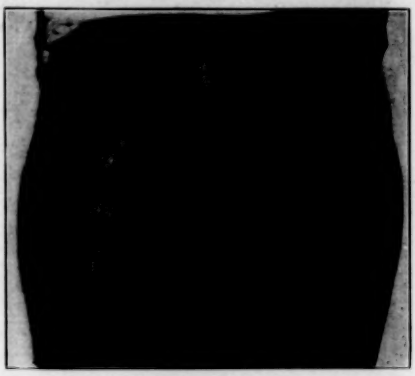

Fig. 5 (case 1).—Classic picture of granuloma inguinale produced experimentally, fiftieth day.

intercourse. . . . He then noticed a lump in the right inguinal region." Typical ulcerative lesions of granuloma inguinale later developed. In two of the

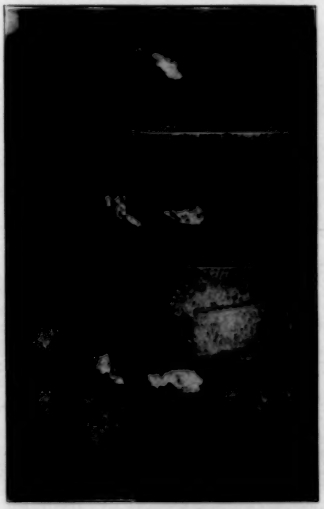

Fig. 6.—Experimental granuloma inguinale: *a*, forty-fourth day; *b*, sixtieth day; *c*, sixty-sixth day.

three cases reported by Shattuck, Little and Coughlin[8] it is noted that a history of a previously incised bubo was recorded. Numerous similar examples are to be

5. Greenblatt, R. B., and Sanderson, E. S.: The Intradermal Chancroid Bacillary Antigen Test as an Aid in the Differential Diagnosis of the Venereal Bubo, Am. J. Surg. **41**: 384 (Sept.) 1938.

6. Poindexter, H. A.: Some Studies on Etiology of Granuloma Inguinale, J. Lab. & Clin. Med. **20**: 353 (Jan.) 1935.

7. Gruhzit, O. M.: Granuloma Inguinale, Am. J. Trop. Med. **3**: 289 (July) 1923.

8. Shattuck, G. C.; Little, H. G., and Coughlin, W. F.: Treatment of Inguinal Granuloma with Thioglycollates of Antimony, Am. J. Trop. Med. **6**: 307 (Sept.) 1926.

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found in the literature. In the excellent series of cases studied by Lynch,[9] bilateral buboes occurred in case 8. His interpretation of this case that it "is apparently a granuloma of the perineum, then extending to ruptured

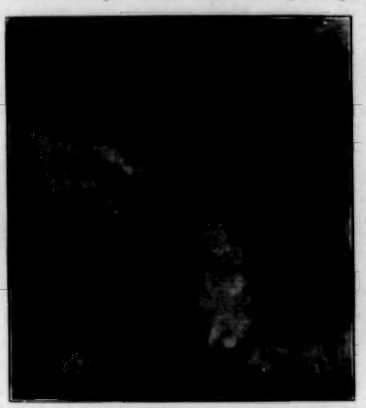

Fig. 7.—Pseudobubo of granuloma inguinale one day after aspiration of inguinal swelling. Inguinal lesion was preceded by penile lesion.

gonorrheal buboes in the groins, coupled with active gonorrhea and syphilis" must be considered as gratuitous. Nair and Pandalai[10] observed that granuloma

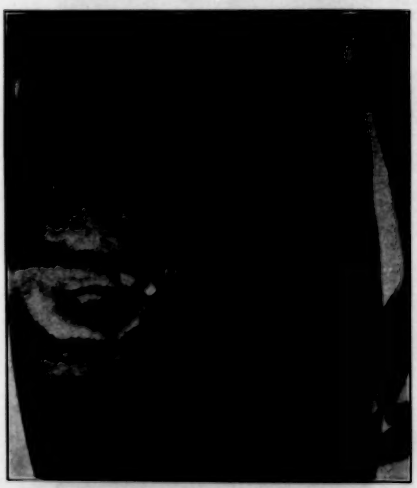

Fig. 8.—Inguinal lesion preceded by a primary focus on the penis.

inguinale followed on incision of buboes. They failed to realize that the incised inguinal swelling was at the onset but a phase of the disease and offered the naive explanation that surgical trauma predisposes to granuloma inguinale.

Traditional teaching has repeatedly emphasized that granuloma inguinale is a disease of the skin and corium and not of the lymphatics.[11] Fox[12] stresses that "one of the striking features of the disease is the absence of enlargement of the neighboring lymphatic glands." The following statement by Harris[13] probably represents the general impression: "There is usually no inguinal involvement, never bubo formation." On the other hand, what did Patch[14] mean when he wrote "Seldom are the lymph glands involved. When they are, they suppurate and break to the surface and form large granulation masses." It is possible that Patch was quoting Mayer and da Rocha Lima,[15] whose authorities in turn were Thierfelder and Thierfelder Thillot.

The question arises How does this disease gain hold in the inguinal region following primary infection of the external genitalia? Excised tissue from the inguinal ulcerations studied microscopically by us has shown a diffuse granulomatous reaction in the papillae, corium and subcutaneous tissues and is not comparable to the adenitis found in venereal lymphogranuloma, chancroid or syphilis. Hence by definition it is not a bubo but a

Fig. 9 (case B).—Cervical abscess; extragenital granuloma inguinale.

subcutaneous granuloma. We have therefore coined the term "pseudobubo" to describe this inguinal swelling which so frequently simulates the bubo of the other venereal diseases. It would seem therefore that the clinical observation by Thierfelder and Thierfelder Thillot[16] that "suppurative buboes result which perforate through the skin and are characterized by granulation tissue raised high above the surface" is now subject to proper interpretation. By what route does the disease reach the inguinal region? Autoinoculation occurs but the frequency with which the inguinal region alone is involved after genital infection is more than mere coincidence. What role do the lymphatics play in the dissemination of this disease? A suggestion may be found in the analysis of the following case:

9. Lynch, K. M.: Granuloma Inguinale, J. A. M. A. 77:925 (Sept. 17) 1921.
10. Nair, V. G., and Pandalai, N. G.: Granuloma Inguinale, Indian M. Gaz. 69:361 (July) 1934.
11. Greenblatt, R. B.; Sydenstricker, V. P., and Pund, E. R.: Fourth and Fifth Venereal Diseases, J. M. A. Georgia 28:16 (Jan.) 1939.
12. Fox, Howard: Granuloma Inguinale, J. A. M. A. 87:1785 (Nov. 27) 1926.
13. Harris, R.: Granuloma Venereum: General Discussion with Report of Case of Laryngeal Involvement, Laryngoscope 40:707 (Oct.) 1930.
14. Patch, F. S., and Blew, C. L.: Granuloma Inguinale: Its Presence in Canada, Canad. M. A. J. 22:637 (Nov.) 1930.
15. Mayer, M., and da Rocha Lima, H.: Handb. d. Haut u. Geschlechtskr. 23:433, 1927.
16. Thierfelder and Thierfelder Thillot, quoted by Mayer and da Rocha Lima.[15]

STUDY OF THE LYMPH NODES IN GRANULOMA INGUINALE

CASE B.—M. W., a Negro woman aged 31, was admitted to the University Hospital with granuloma inguinale of the vulva, vagina, inguinal regions and right side of the neck.[17] Tissue sections from the neck and inguinal ulcerations revealed the characteristic pathologic condition and the pathognomonic cells with Donovan bodies. Several inguinal lymph nodes from the left groin were excised at the same time and microscopic study of the nodes revealed nothing unusual. Her response to fuadin therapy was remarkable. One year later she returned with a recurrence on the vulva and groins and a small subcutaneous abscess on the left side of the neck (fig. 9). Aspiration of this abscess revealed typical Donovan bodies. The tissue underlying this cervical abscess was indurated and some of the deep nodes were enlarged and palpable. Surgical excision was performed of the neck lesion with the underlying lymph nodes as well as the right inguinal lesion and inguinal lymph nodes.

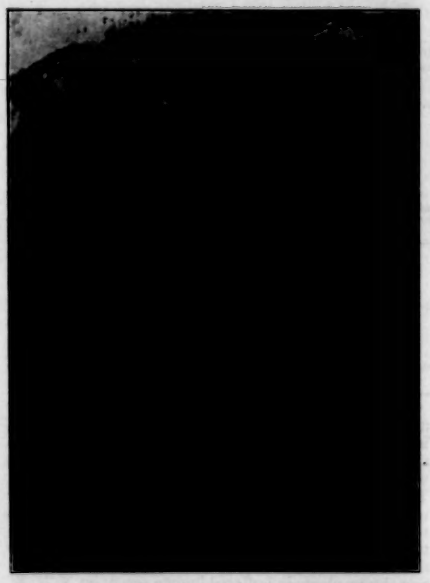

Fig. 10 (case B).—Section from cervical lymph node exhibiting focal suppuration and perilymphadenitis.

Microscopic examination revealed that the areas of ulceration of the neck and the inguinal region exhibited the characteristic picture of granuloma inguinale with the pathognomonic cells containing the Donovan bodies.[18] The most superficial cervical lymph node, just beneath the area of ulceration, was enlarged to 1.5 cm. in diameter and contained foci of suppurative inflammation (fig. 10). In these foci many Donovan bodies were demonstrated (fig. 11). One of the inguinal lymph nodes similarly was involved. In two other small lymph nodes from the inguinal region no Donovan bodies were seen; however there was perilymphadenitis with lymphocytic infiltration of the capsule.

The demonstration of the pathognomonic cells filled with intracystic spaces containing Donovan bodies in suppurative lymph nodes opens new avenues of thought and room for speculation. Inguinal lymph nodes were studied microscopically in three other cases. One small inguinal lymph node removed at autopsy in a patient

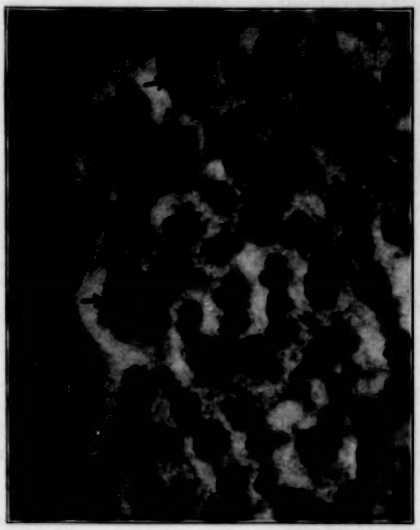

Fig. 11 (case B).—Section of cervical lymph node under high power, showing the pathognomonic cells filled with intracystic spaces containing Donovan bodies. Note the accompanying polymorphonuclear leukocytic response.

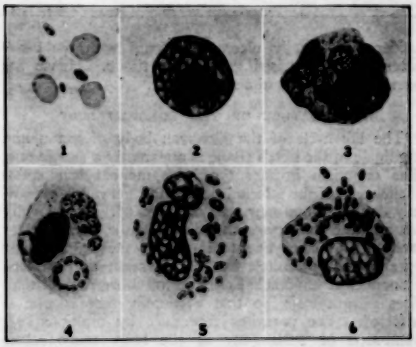

Fig. 12.—Camera lucida drawings to illustrate possible life cycle of Donovan bodies (Dienst), reduced from a magnification of 1,500 diameters: 1. Mature extracellular organisms with red blood cells. 2. Large mononuclear endothelial cell showing early invasion with Donovan bodies. 3. Infected cell showing multiplication of immature parasites in cystic spaces. 4. Further multiplication and maturation of parasites in monocyte. 5. Individual organisms becoming mature. 6. Mature encapsulated Donovan bodies escaping from ruptured and disintegrating monocyte.

with extensive granuloma inguinale of the pudenda revealed an overwhelming infection with Donovan bodies. It seemed that almost the whole lymph node was replaced with large endothelial cells containing

17. Greenblatt, R. B.; Torpin, Richard, and Pund, E. R.: Extragenital Granuloma Inguinale, Arch. Dermat. & Syph. 38: 358 (Sept.) 1938.
18. Pund, E. R., and Greenblatt, R. B.: Specific Histology of Granuloma Inguinale, Arch. Path. 23: 224 (Feb.) 1937.

encysted Donovan bodies, accompanied by a very mild leukocytic response. In case A and experimental case 1, the excised inguinal nodes showed moderate endothelial hyperplasia but no Donovan bodies. Apparently the Donovan bodies are not always found in the regional lymph nodes. What conclusions, if any, may be drawn from such observations to account for the frequency with which inguinal pseudobuboes follow primary genital infection? Is it possible that Donovan bodies travel along the lymphatics and reach the regional lymph nodes where temporary though mild focal reactions and perilymphadenitis occur but ultimately subside? The hypothesis is advanced that during this process, by some means at present not understood, the Donovan bodies reach the corium, where they flourish best. Here the process may be subacute, resulting in a subcutaneous abscess, or it may be chronic and a massive granulomatous tissue bulges the overlying epidermis. Finally ulceration occurs with the characteristic clean raised granulation tissue. Hence the pseudobubo of granuloma inguinale.

Experimental Production of Granuloma Inguinale

Day	Appearance	Comment
1	.....	Subcutaneous inoculation of pus in which a pure culture of Donovan bodies was contained: (a) right groin 0.5 cc., (b) left groin 1 cc., (c) thigh 0.5 cc.
5	Small indurated areas at sites of injection; gradual increase in zones of induration	
25	(a) Right groin raised subcutaneous nodule 0.3 by 0.3 by 0.3 cm. (b) Left groin raised subcutaneous nodule 1.5 by 0.5 cm.	
33	(a) Right groin raised indurated nodule 3 by 1 by 1 cm. (b) Gradual softening of nodule in left groin with development of abscess 4 by 4 by 3 cm.; underlying zone of induration is twice size of abscess (c) Left thigh indurated zone covered by superficial bleb 1 by 1 cm.	4 cc. of pus aspirated; smears reveal abundance of Donovan bodies to exclusion of all other micro-organisms
43	(a) Inguinal abscess (right groin) 3 by 2 by 2 cm.	2.5 cc. of pus aspirated; smears reveal abundance of Donovan bodies to exclusion of all other micro-organisms
49	(a) Right groin small red granular ulcer at site of aspiration (b) Left groin typical elevated red granulomatous ulceration (c) Left thigh superficial bleb rubbed off, leaving a red velvety granular surface	Smears made of scrapings from all 3 surfaces reveal Donovan bodies
50	Lesions have matured into classic picture of granuloma inguinale	Fuadin therapy started
70	Lesions well localized and clean; minimal response to therapy	Course of sulfanilamide started
84	Lesions are practically resistant to therapy; improvement is very slow	Surgical excision; microscopic examination reveals pathognomonic cells and characteristic pathologic changes

THE NATURE OF THE DONOVAN BODY

The life cycle of the Donovan body of granuloma inguinale in the host's tissue is apparently a simple one. The organism invades the large mononuclear endothelial cells of the infected tissue until the cell is eventually destroyed and new cells are invaded. Occasionally neutrophilic leukocytes and perhaps the mononuclear leukocytes phagocytize and destroy the extracellular encapsulated parasites, but the invasion of the large mononuclear endothelial cells occurs more rapidly than does phagocytosis, so that eventually more tissue is infected. The parasites reproduce by multiple segmentation or schizogony in the large mononuclear endothelial cells. Sometimes there may be as many as six foci of reproduction within one large mononuclear cell. The immature bodies resulting from multiple segmentation mature within cystic spaces created in the parasitized cells until each organism is fully developed and apparently encapsulated. The infected cell finally ruptures and the mature Donovan bodies are liberated (fig. 12).

The encapsulated form is the most resistant stage of the parasite, as it can be demonstrated by Wright's stain in the specific exudate stored four weeks in the ice box. The encapsulated form is also the last to disappear after attempted cultivation in vitro.

GROWTH REQUIREMENTS

The Donovan bodies are strictly tissue parasites of man. The organisms are not pathogenic for rabbits, guinea pigs, rats and mice when pure cultures are inoculated intraperitoneally, intratesticularly or subcutaneously. Several mice were inoculated intracranially and no pathogenic manifestations developed. Chick embryos were also inoculated with no demonstrable effects.

The Donovan body is not culturable in vitro by methods used to propagate fastidious bacteria, Rickettsial bodies and viruses. Such enriched mediums as N. N. N. medium, Loeffler's serum, infusion agar with defibrinated human blood, infusion agar with defibrinated rabbit blood, various solutions of human serum in buffered dextrose solution, tubes of serum with minced rabbit spleen and tubes of minced chick embryo were inoculated with exudate rich in Donovan bodies. This exudate was obtained by aspirating aseptically unruptured pseudobuboes in which the Donovan bodies were observed in pure culture. Some of the transplants were incubated as long as two months and at no time was multiplication of the parasites observed. Serial transplants in buffered human serum on N. N. N. medium containing blood was attempted with no multiplication of the parasites.

EVIDENCE FAVORING THE PROTOZOAN NATURE OF THE DONOVAN BODIES

Donovan bodies are probably protozoans, particularly sporozoans, as evidenced by the following observations: 1. The organism is highly selective for its particular host. 2. The organism reproduces in living tissue and only in large mononuclear endothelial cells. 3. The method of reproduction is by multiple segmentation within specific tissue cells. 4. Antimony and potassium tartrate has therapeutic action. 5. Infection recurs after apparent healing.

SUMMARY

Granuloma inguinale was experimentally reproduced in three human beings but failed to develop in one. It failed to develop in laboratory animals in spite of

repeated attempts. When the disease was reproduced, the course was comparable in every way to that seen in spontaneous cases. Donovan bodies were recovered to the exclusion of other organisms from the pseudobuboes that developed in each of the three patients. The incubation period could not be determined; however the classic picture of the disease was full blown in about fifty days. This is the first instance in which granuloma inguinale was experimentally produced in a human being by the use of an exudate which contained only the Donovan body and no other demonstrable organisms.

The pseudobubo that so frequently follows a primary focus on the external genitalia is not an adenitis per se but a subcutaneous granuloma. The histopathologic study of regional and underlying lymph nodes revealed but a moderate endothelial hyperplasia. However, in two patients, one of whom also had extragenital involvement, Donovan bodies were demonstrated in the underlying cervical and inguinal lymph nodes, and in the other in one regional inguinal node. Such observations prove that the Donovan body can and does travel by way of the lymphatics. The hypothesis is presented that Donovan bodies may reach the lymph nodes, where temporary though mild focal reactions with perilymphadenitis occur. During this process Donovan bodies may reach the papillae and corium of the overlying skin and set up a subcutaneous granuloma. Here the process may be subacute, resulting in a subcutaneous abscess, or may be chronic and a massive granulomatous tissue bulges the overlying epidermis. Hence the pseudobubo, for prior to rupture and the burgeoning of the typical raised granulations it simulates the bubo of the other venereal diseases.

The nature of the Donovan body remains an enigma to most students of the subject. Contrary to the many reports on the isolation and culture of an organism comparable to the Donovan body, it is doubtful whether the causal agent of granuloma inguinale has ever been cultivated. Such cultivated organisms on inoculation into human beings have failed in every instance to reproduce the disease. The method of reproduction in mononuclear endothelial cells and the growth requirements of the organism as well as the clinical behavior of the disease lead us to assume that the Donovan body is a sporozoan.

ABSTRACT OF DISCUSSION

DR. H. M. ROBINSON, Baltimore: This is an important and significant contribution to a puzzling condition. Thirty-five years ago Donovan reported that certain encapsulated organisms were the cause of granuloma inguinale. Many have since confirmed this but it has not yet been accepted by all authorities. In September 1937 Butts stated that spirochetes and rapidly motile bacilli, found in eight cases of granuloma inguinale, were the cause of this disease, because the administration of antimony compounds caused loss of motility and finally disappearance of these organisms. Certainly, such organisms can be demonstrated in the superficial secretion from the surface of the lesions, both by dark field examination and by stained smears, but are not found after the surface detritus and pus has been completely removed or in material obtained from the base of the lesion. Morphologically these spirochetes are of the refringens type and the motile bacteria are fusiform bacilli. On the other hand, the encapsulated and nonencapsulated organisms known as the Donovan bodies are to be found in all undoubted clinical cases of granuloma inguinale and, if material is obtained from the base of the lesion, only these bodies are found. The authors have reproduced a characteristic clinical picture of the disease by injecting material rich in Donovan bodies. That they have not been able to grow Donovan bodies in any of a variety of mediums does not discredit their work. I also have tried but have failed to grow Donovan bodies on any of several mediums. I have not seen pseudobuboes or found any associated palpable lymph nodes. None of the five cases at present under my care present these lesions. Regarding the therapeutic results of the antimony salts, I have stated heretofore that the antimony salts may be used as a therapeutic test in granuloma inguinale. My later impression is that this is too radical a statement, because one obtains good results with the antimony salts only in early cases, whereas in late cases results with these drugs are generally disappointing. Unfortunately there is no easy method of diagnosis for this disease. Only by careful technic in making smears and the careful staining and demonstration of Donovan bodies can the diagnosis be made.

DR. S. WILLIAM BECKER, Chicago: A comparatively new concept has been presented that granuloma inguinale may be not simply a local disease. I should like to mention a case in which the infectious organism not only had spread into the lymphatic nodes but had become actually systemic. The patient had been treated in various Chicago clinics for a good many years, finally was given up as hopeless and went to Oak Forest, which is a home for hopeless invalids supported by Cook County. At autopsy lesions of granuloma inguinale were found in the intestinal tract and the ribs. The pelvic structures were involved, probably by direct extension. As far as I know, this is the first case on record in which systemic lesions have been seen and I have every reason to believe that in this case at least it was probably a blood borne systemic infection. It will be reported by Dr. Humphreys.

DR. ARTHUR G. SCHOCH, Dallas, Texas: I should like to mention briefly one case of pseudobubo of seven I have observed in the last year and a half with proved granuloma inguinale. A Negro woman had typical lesions on the genitalia. The pseudobubo responded to treatment along with the lesions of the perineum. I am interested in esthiomene, a so-called entity that has two factors, elephantiasis plus ulceration. I have a paper accepted for publication in which I think I have three proved cases of typical esthiomene due to granuloma inguinale and not to the virus of venereal lymphogranuloma. I have comparatively little difficulty in demonstrating the Donovan body. In the last year and a half I have looked, I think faithfully, for the so-called large giant cell which is supposed to be pathognomonic in biopsy specimens described by Greenblatt, Dienst, Pund and Torpin and I have been unable to date to demonstrate that cell.

DR. SAMUEL GOLDBLATT, Cincinnati: The results in Cincinnati with both fuadin and antimony tartrate medication have been rather disappointing. Early in my experience it was noted that patients who showed toxic reactions, chiefly a generalized toothache, following the administration of the antimony derivatives usually recovered rapidly and remained well. When there were no toxic manifestations to these drugs the lesions usually did not respond. After a fairly extensive experience with the antimony salts I began to utilize electrosurgical excision of the lesion with coagulation at the base. I obtained very good results. Recurrences were few and were seen only during the early conservative period when I was afraid to remove too much. The line of excision must extend from 0.5 to 1 cm. outside the border of any palpable lesion. Recently, and this is too recent to have very much significance, I have seen some of these pseudobuboes described by the authors. Under the probably mistaken idea that there might be venereal lymphogranuloma associated with the granuloma inguinale, I gave the patient sulfanilamide in fairly large doses. The response was surprisingly good. Whether these good results will continue in the future, I do not know. It might be worth while to investigate the effect of large doses of sulfanilamide or even sulfapyridine in the treatment of granuloma inguinale.

DR. FRED D. WEIDMAN, Philadelphia: In one respect I was disappointed in the reading of this paper because a most interesting phase was perforce skimped, namely some of the peculiar characteristics of the micro-organism. As shown on the screen, it would appear that they were occurring in clusters within a capsule and, furthermore, that the parasites were much fewer in the center than in the periphery of the aggregation. That

recalls something of the order of a fungous micro-organism. It is well known that Coccidioides immitis, for example, will appear that way, and in rhinosporidiosis too the same kind of a general scheme of construction is observed. Now there is another parasite, Histoplasma capsulatum, which as far as I know has not been thus far reported in the skin and in which the history has been along these same lines; namely, that for a long time the parasite was regarded as a protozoon. Eventually it was cultivated and revealed as a fungus. Dr. DeMonbreun was among the first in this country to accomplish this. I would be pleased if Dr. DeMonbreun is here to have him give his impression of the possibility that the parasite pictured this afternoon is a fungous one. The lesson from this is that, simply because we have failed with ordinary bacteriologic methods to cultivate the parasite of granuloma inguinale is no reason why we should at once jump to the conclusion that it is not cultivable. It is only the method that awaits the cultivation of this micro-organism, and perhaps it is the mycologic one. If the authors have the time, I should like to hear more about the details of the arrangement of the parasite in the cell.

Dr. W. A. DeMonbreun, Nashville, Tenn.: Dr. Goodpasture and I have studied the organism of granuloma inguinale on various mediums. We were also fortunate in having one case in which we got pus from an unruptured lesion but could not cultivate organisms from it. We watched the Donovan bodies degenerate and disappear from the cultures. From other cases we did cultivate a gram-negative bacillus belonging to the aerogenes group, but not in primary cultures. We cultured the exudate from the lesions on chorio-allantoic membranes of chick embryos for from three to five days when subcultures from the membranes yielded an unencapsulated gram-negative bacillus on blood agar. After two or three weeks secondary colonies were noted in the colonies and occasionally encapsulated organisms that had the morphology of the Donovan body were found in them. We planted the cultures directly from blood agar into undiluted human serum and sealed the cultures. In eight or ten days we noticed encapsulated forms that went through all the morphologic changes that we observed the Donovan body doing in the lesion. In several instances we also recovered the same organism from the lesions by cultivating the granulomatous tissue in infusion broth. During the first three or four days staphylococci usually grew out in abundance but in four or five days most of these organisms were degenerated, and subcultures on blood agar yielded the organism I have described. By cultivating feces from several of the patients, we obtained the some organism. However, we could not reproduce the disease with the organism, even though we tried to do so in several human volunteers. I think that most physicians who have studied numbers of smears from lesions of granulma inguinale conclude that the organism goes through a definite cycle, and perhaps the phase of the organism which we succeeded in cultivating is not the pathogenic phase. With regard to the generalized lesions that have been reported in two or three of these cases, I, like Dr. Weidman, would like to know more about the appearance of the organisms in the lesions. In histoplasmosis, which is caused by the fungus Histoplasma capsulatum, there is a widespread infection of the reticuloendothelial cells by this fungus. In sections there is a superficial resemblance of the encapsulated, yeastlike, intracellular forms of the fungus to Donovan bodies and the possibility that the so-called generalized cases of granuloma inguinale are really cases of histoplasmosis should be considered.

Dr. Robert B. Greenblatt, Augusta, Ga.: Dr. Robinson quoted the work of Butts, who maintained that in the lesions in all his cases a spirochete was found. That isn't new. Some thirty-five years ago Maitland and Wise, and some years after that Cleland had the idea that spirochete is the causal agent because of the frequency with which it is found in the open lesions of granuloma inguinale. From time to time one investigator or another crops forth with the same idea. I wrote Dr. Butts following the appearance of his article and pointed out that some spirochete or other may be demonstrated in a large percentage of the chronic ulcerations about the genitalia regardless of the etiology of the lesion. Dr. Becker described a case in which systemic manifestations of this disease occurred. This is very interesting and a rare occurrence. There are in the literature reports by Thierfelder and Thierfelder Thillot of several cases in which visceral abscesses in which Donovan bodies were demonstrated were observed at autopsy. Mayer and da Rocha Lima quote the case of Hoffman and that of Kuhn in which generalization of the disease occurred with involvement of the bones, liver and other visceral organs. I regret that Dr. Schoch has been unable to demonstrate the pathognomonic cell in tissue sections. We have found useful not only well prepared sections stained by hematoxylin and eosin but also sections submitted to the old fashioned Dieterle silver stain. The Donovan bodies are beautifully demonstrated within the cysts of the large mononuclear cells. Dr. Goldblatt remarked that antimony tartrate is unsatisfactory in therapy. The longer we work with this disease the more ready are we to agree with him. We have found many cases respond well to antimony and potassium tartrate or fuadin only to be seen at a later date with a recurrence. The use of sulfanilamide in this disease has proved of no value. We have pointed out in another publication that sulfanilamide has but a limited place in the therapy of venereal lymphogranuloma. Let me state that 50 per cent of the buboes of venereal lymphogranuloma will subside without therapy and they who report such excellent results with this drug are unmindful of the incidence of spontaneous cures. Dr. Weidman's points are well taken. I regret that time did not permit me to dwell on the nature of the Donovan body. It is however more fully handled in the text of this paper. We concur with Dr. Weidman in the contention that the Donovan body is not a bacterium.

THE SILICOSIS HAZARD IN MECHANICAL DENTISTRY

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On the long list of industries known to be associated with the silicosis hazard, mechanical dentistry is not to be found. It is our purpose in this communication to indicate that a silicosis hazard is present in this hitherto unlisted industry and to suggest the steps which may be taken in the elimination of the hazard.

REPORT OF CASE

History.—C. J., a man aged 35, a Russian Jew, employed as a dental technician, was admitted to the Division of Pulmonary Diseases of Montefiore Hospital Nov. 16, 1937. He had been transferred from another hospital, where a diagnosis of pulmonary tuberculosis had been made. His illness commenced in January 1936 when a slightly productive morning cough was noted. This complaint was mild and was ignored. In December the patient remarked that breathlessness was present on moderate exertion. In January 1937 a small hemoptysis occurred and this recurred at irregular intervals thereafter. In April weakness and loss of weight supervened. He sought medical advice and entered a hospital for treatment August 30. At the hospital a diagnosis of chronic bilateral pulmonary tuberculosis was made and the patient was treated with bed rest. The sputum contained tubercle bacilli.

On admission to Montefiore Hospital physical examination revealed that the patient was poorly nourished and had slight dyspnea at rest. There was moderate cyanosis of the lips and nail beds, but clubbing of the fingers was absent. The chest was increased in its anteroposterior diameter. There was dulness and impaired resonance over the upper part of the chest. Harsh bronchovesicular breathing was heard throughout the chest with universal medium, moist rales. Musical rales were heard over the right base posteriorly. The rest of the physical examination elicited no abnormalities.

From the Division of Pulmonary Diseases, Montefiore Hospital, and the Division of Industrial Hygiene, New York State Department of Labor. Drs. Leonard Greenberg, Adelaide Ross Smith and May R. Mayers of the Division of Industrial Hygiene, New York State Department of Labor cooperated with the authors in this work.

Examination.—X-ray films of the chest on admission (fig. 1) showed that both lung fields contained numerous soft nodular densities from apex to base. These nodules varied in size from that of a pea to that of a hazelnut and lay within a meshwork of coarse, strandlike densities. The mediastinal shadows were considerably widened and increased in density. There was a cavity 4 cm. in diameter in the right lower lung field. A fluid level was present within the cavity.

The sputum contained tubercle bacilli. The sedimentation rate of the red cells (Cutler) was 25 mm. at the end of one hour. The blood count showed a slight leukocytosis but the differential count was not abnormal. The Wassermann and Kahn reactions of the blood were negative. A twenty-four hour specimen of urine contained no tubercle bacilli on smear. The vital capacity was 1,850 cc. The circulation time was nine seconds (saccharin) and seven seconds (ether). The venous pressure in both arms was 8.1 cm.

Occupational History.—Because of the suggestive x-ray appearance, additional detailed investigation of the patient's occupation was made: The patient had migrated to America at the age of 8 years and went through the public schools. From the age of 16 until the time of admission to the hospital, i. e. for nineteen years, he worked for the same dental laboratory and performed the same operation without any break in his employment. The patient was the only employee doing this type of work.

His work consisted exclusively of polishing dentures. Because of the large volume of work which the establishment turned out, he was required to polish as many as fifty dentures during an eight hour day. The polishing operation is performed on a cloth wheel which is attached to an electrically driven spindle. The abrasive material, a very finely ground powder known as "pumice," is kept in a small pan situated just below the revolving polishing wheel. Water is added to the powder and the moistened powder is applied to the surfaces and crevices of the dentures to be polished. The denture is held against the revolving wheel with frequently renewed applications of the abrasive until the rough spots in the denture are all smooth. The polishing machine which the patient used was located in a small alcove 30 feet from the nearest window. No suction device or other means of ventilation was provided for the purpose of drawing off the rising dust.

The dust constantly irritated the patient's nose and throat and over the years he took crude precautions against its aspiration. His work clothes consisted of an apron and a skull cap, the latter because he found that his hair, when uncovered, was laden with dust at the end of the day. In summer, particularly, the dust seemed to be more irritating, and the patient would at times wear a wet towel over his nose and mouth. About a year before his incapacity he bought a crude rubber mask but discarded it soon after because he could not breathe through it easily. When his pulmonary symptoms finally appeared he ascribed them to the dusty nature of his work.

This occupational history, associated with the x-ray signs, suggested a tentative clinical diagnosis of silicotuberculosis.

Course.—During his stay at Montefiore Hospital the cough increased and the expectoration became mucopurulent and more copious. The temperature ranged up to 101 F. The cyanosis and dyspnea were more prominent, so that the patient could not walk across the room without extreme breathlessness. April 15, 1938, five months after admission, he had a profuse hemoptysis. He died April 23.

Postmortem Examination.—The lungs were voluminous, and numerous firm areas could be felt throughout (fig. 2).

Right Lung: The visceral pleura was dull and thickened and the pleural cavity was obliterated by adhesions over the upper lobe. A fine fibrinous pleurisy was present over the lower lobe but there was no fluid in the pleural cavity. The lung cut with great difficulty and was almost stony hard in its upper half. The cut surface was grayish black and extremely gritty. Gray-black pigment was most prominent in the airless upper lobe where the fibrosis was most marked. It was difficult to detect any discrete nodules in the upper lobe, but these were present in great profusion, uniformly studding the middle and lower lobes. The nodules were darker than the surrounding lung tissue; they were firm, protruded from the surface and varied in dimension from the size of a millet seed to that of a small pea. In the middle lobe these nodules were surrounded by small yellow areas of caseation. The middle lobe contained two large cavities with thin walls which were lined with caseous material. They communicated with the bronchial tree and one of them contained a large blood clot. An eroded pulmonary vein was found in the wall of the cavity. The lower lobe contained areas of caseation and was emphysematous, particularly at its inferior margins.

Left Lung: Except for the absence of tuberculous cavities, this lung presented an appearance essentially similar to that of the right lung. The paratracheal and bronchopulmonary lymph nodes were enlarged to three or four times their normal size. They were stony hard and cut with difficulty. On the cut surface, which was gritty, numerous, gray-black nodules stood out from a black background.

Other abnormalities included hypertrophy of the right ventricle with considerable dilatation of the outflow tract, mild atherosclerosis of the pulmonary artery, chronic passive congestion of the viscera and a few tuberculous ulcers in the ileocecal region.

Microscopic examination from various sections of the lungs revealed the following: In the upper lobes the normal architecture of the pulmonary tissue was almost completely destroyed. Dense fibrous tissue with anthracotic pigment was seen in its place. No typical silicotic nodules were present in this area. In sections taken from the midlung fields caseation predominated with typical areas of caseous bronchopneumonia. Interspersed among these foci of tuberculosis lay large silicotic nodules with their typical whorls of dense hyalinized fibrous tissue, in the meshes of which lay pigment laden macrophages (fig. 3). The nodules stained deeply red with the Van Gieson stain except in those areas in which the caseation had loosened the hyaline strands within the silicotic nodule. In such nodules the areas adjoining the caseous foci no longer stained deeply red. In the lower fields of the lung numerous typical silicotic nodules, partly coalescing, could be seen with adjoining areas of nonspecific bronchopneumonia.

Fig. 1.—Appearance of chest Dec. 16, 1937. Nodular densities from apex to base, uniformly distributed in both lung fields, lie within a meshwork of strandlike densities. A cavity in the right midlung field with a fluid level is not clearly reproduced. Both hilar shadows are considerably widened and increased in density.

The postmortem diagnosis was far advanced silicotuberculosis, hypertrophy and dilatation of the right ventricle, chronic passive congestion of the viscera and tuberculous ulcers of the small intestine.

Chemical Analysis: Postmortem samples from various areas of the lungs and lymph nodes were analyzed for content of silica with the results given in table 1.

COMMENT

These results run parallel to those of analyses on eight silicotic lungs reported by Sladden.[1] The percentage of total silica of dry lung tissue in his series ranged between 0.6 and 1.0 in cases in which an advanced stage of fibrosis associated with tuberculosis was present.

Our samples of lung tissue yielded a somewhat higher percentage of ash of dry matter than that reported by

1. Sladden, A. F.: The Silica Content of Lungs, Lancet 2: 123 (July 15) 1933.

McCrae.[2] Riddell and Rothwell[3] report analyses of the lungs of two patients who died of silicotuberculosis in which the total silica of ash of the dried lungs was about 15 per cent, slightly higher than what we found in our samples of lung.

Fig. 2.—Cut section of specimen of lung. Gray-black discoloration of the pulmonary tissue with diffuse fibrosis most prominent in the upper two thirds of the lungs. Silicotic nodules best seen in the lower fields of the lung with small areas of caseation. Enlarged black lymph nodes are seen in the hilar area.

Our patient was allegedly using pumice during the nineteen year span of his polishing work. Pumice, according to analyses made by the U. S. Bureau of Mines,[4] is a mixture of complex silicates of aluminum, sodium, potassium, calcium, magnesium and iron in approximately the percentages given in table 2.

TABLE 1.—*Chemical Analyses of Samples of Lung and Lymph Node*

	Lung	Lymph Node
Dry tissue of fixed tissue as received, per cent	30.90	29.50
Ash of dry matter, per cent	11.00	11.70
Total silica of ash, per cent	10.10	8.10
Total silica of dry tissue, per cent	0.91	0.70

This report does not state whether pumice contains free silica. Knowledge of the free silica content of a dust is crucial toward an evaluation of the silicosis producing possibilities of the dust. However, nowhere in the literature could such information be found with reference to pumice. Pumice dust is included in the list of harmful siliceous dusts along with quartz, sand, granite and slate,[5] but it is not entirely clear in what basis this dust is so included.

2. McCrae, John: The Ash of Silicotic Lungs, South African Inst. M. Research **1**:1-8 (March 3) 1913.

3. Riddell, A. R., and Rothwell, H. E.: Some Clinical and Pathologic Observations on Silicosis in Ontario, J. Indust. Hyg. **10**:147-157 (May) 1928.

4. Hatmaker, P.: Pumice and Pumicite, U. S. Bureau of Mines, information circular 6560.

5. Sayers, R. R.: Harmful Industrial Dusts, Pub. Health Rep. **53**: 224 (Feb. 11) 1938.

The only reference to the noxious effects of pumice dust that could be found appears in a report by DiMattei,[6] who examined and took chest films of 100 pumice mill workers on the Lipari Islands (the source of 90 per cent of the total amount of the pumice imported into the United States). These mill workers are engaged in grinding the lump pumice into a fine powder and, according to the author, they work in a dense cloud of this dust. X-ray examination revealed

TABLE 2.—*Composition of Pumice*

Silica (SiO_2)	72.0%
Alumina (Al_2O_3)	14.0%
Potash and soda (K_2O–Na_2O)	7.0%
Lime and magnesium (CaO–MgO)	2.5%
Iron oxide (Fe_2O_3–FeO)	1.0%
Loss on ignition	3%-5%

that almost all the workers were suffering from silicosis. DiMattei states that tuberculosis is so common among the islanders that new operatives must constantly be imported from outlying provinces to replace these workers. He attributes the occurrence of silicosis to the prolonged aspiration of the pumice dust and seeks

Fig. 3.—A silicotic nodule in microscopic section showing typical whorls of hyalinized fibrous tissue in whose meshes lie pigment laden macrophages. Hematoxylin and eosin stain.

to support this contention with chemical analyses of the pumice dust which, he states, contains approximately 75 per cent of total silica. Unfortunately he too neglects to make any statement regarding the free silica content of the dust.

6. DiMattei, G.: La pneumoconiosi nei lavoratori della pomice e della lava, Atti del X Congresso Nazionale di Medicina del Lavoro, 1932, pp. 546-552.

Dr. W. F. McConnell [7] of the industrial health section of the Metropolitan Life Insurance Company informs us that no free silica could be found in two specimens of pumice analyzed in his laboratory and that the silica existed only in the combined form of silicates. Since it is generally agreed that silicates, with the exception of asbestos, do not produce classic pneumoconiosis, this discrepancy between DiMattei's clinical observations and the available chemical analyses of pumice could be explained only by an exceptionally wide variation in the free silica content of pumice.

Since pumice is fairly widely used in industry, further investigation of its free silica content as well as of its disease-producing potentialities seems warranted.

A sample of the "pumice" which our patient used was obtained from his dental laboratory and was chemically analyzed. It contained the surprisingly high content of 48 per cent free silica. The reason for this high percentage of free silica was disclosed after an investigation of three concerns selling abrasive materials to the dental laboratories. It was learned that these concerns were selling a less expensive substitute abrasive powder called "pummy," the substance with which our patient was working. "Pummy" has the same composition as silex, being also silica sand but ground to a greater degree of fineness. This relatively new silica-containing substitute abrasive material came into use for dental purposes during the World War, when Italian pumice was difficult to obtain. Pumice and its substitute "pummy" are sold in about equal amounts to the dental laboratories in the New York City area. None of the purchasing agents of three other dental laboratories visited were aware that the substitute "pummy" and not pumice was in use in their shops.

It is not possible to state how extensive is the silicosis hazard among operatives in mechanical dentistry. A survey of the industry is being planned at the present writing by the Division of Industrial Hygiene of the New York State Department of Labor.

It is not often that the presence of an industrial health hazard can be definitely established on the basis of one case. In our dental mechanic none of the usual obfuscations appear to obscure the cause and effect relationship between the specific trade and the specific illness. He never worked at any other trade, never did any other job but that of polishing dentures; the autopsy showed classic silicotuberculosis. The abrasive material used contained a high percentage of free silica and his unventilated workroom environment made possible a concentration of the dust known to produce silicosis in other trades where similar concentrations are present.

RECOMMENDATIONS FOR INDUSTRIAL CONTROL

To eliminate the silicosis hazard in mechanical dentistry, certain precautionary steps seem indicated:

The pumice substitute "pummy" should be discarded as a dangerous abrasive material and in its place some harmless material should be used. The question of the possible harmfulness of pumice must await further chemical and clinical investigations.

Many dental laboratories have equipped their polishing apparatus with exhaust hoods. Such exhaust hoods should be required universally.

7. McConnell, W. F., Assistant director, Industrial Health Section, Metropolitan Life Insurance Company: Personal communication to the authors.

SUMMARY

1. An instance of silicotuberculosis occurred in a dental mechanic whose only occupation during life consisted of polishing dentures.

2. Pumice, a silicate complex used in polishing dentures, has been widely replaced by a substitute abrasive "pummy" which contains a high percentage of free silica and which is capable of producing silicosis, as in this instance.

575 West End Avenue.

DIAGNOSING MYELOMATOSIS BY COMPLEMENT FIXATION

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Serum from patients with myelomatosis differs from normal serum in various ways. What has chiefly attracted attention is an increase in the serum protein, mainly in the globulin fraction, which alteration is recognizable by means of various so-called lability reactions. This term is understood to mean reactions which express the fact that the normal colloid stability of the serum is disturbed by reason of a preponderance of the large molecular globulins. Increased serum lability may be manifested in many different ways and may interfere in various seroreactions used for diagnosis, the result being unspecific reactions, that is, reactions that do not express the immunity or the morbid condition which was intended to be demonstrated.

TABLE 1.—*Hemolysis of Sheep Corpuscles with Amboceptor and Complement After Previous Treating of the Latter with Myelomatosis Serum 4*

Serum, Cc.	Native	Heated for Ten Minutes to 54 C.	56 C.	58 C.	60 C.
0.025	100	0	0	0	
0.005	100	10	0	0	
0.0025	100	50	0	0	
0.0010	100	80	0	0	
0.0005	100	100	0	0	Coagulated
0.0001	100	100	0	0	
0.00005	100	100	0	0	
0.00001	100	100	0	0	
0.000005	100	100	10	0	
0.000001	100	100	80	10	

Increased serum lability can be ascertained in many different ways. The addition of salt (half saturation with ammonium sulfate) gives a precipitation greater than normal, i. e. the globulin is increased. The rate of sedimentation is increased, the increased protein content promoting the formation of the erythrocytes into "coin rolls," a phenomenon which can also be observed under the microscope when counting the blood corpuscles. Takata's reaction is positive, mixture with a mercury bichloride solution producing flocculation. The formol-gel reaction is positive, 0.05 cc. of serum coagulating with one drop of solution of formaldehyde. In addition, a number of other reactions are described which express the same change in the serum, an increased globulin content.[1]

Consequently, as the serum of patients with myelomatosis often presents an increase in globulins, it is sometimes possible to diagnose the disease by one of the aforesaid reactions.

From the State Serum Institute, Dr. Thorvald Madsen, Chief.

1. Bing, Jens: Acta med. Scandinav. 91: 336, 1937.

A reaction which I have described previously as occurring in myelomatosis [2] depends on the fact that in many cases of myelomatosis the serum after it has been heated to about 60 C. is able to fix the complement (the anticomplementary property of serum).

By no means all serums from patients with myelomatosis give this reaction. Nevertheless it is of practical importance, as anticomplementary serums now and then are found in the course of routine Wassermann tests. The Serum Institute is thus in a position to draw attention to it. In several cases the reaction has helped in the diagnosis of myelomatosis although there had been only vague general symptoms.

The mechanism of the reaction and the conditions optimal for its performance were described in earlier papers.[3] Here they may be summarized:

1. Complement fixation proceeds without the presence of antigen.

2. The fixating property occurs only after the serum is heated to about 60 C.; it is totally absent in unheated ("native") serum.

3. There is an optimum for the attainment of the maximum fixability both with temperature and with p_H.

4. Fixability is generally more pronounced than is ever the case when one is titrating other complement fixing serums (fixing dose to 0.0000001 cc. of serum).

The anticomplementary serums thus disclose themselves in the course of a complement fixation reaction by the occurrence of fixation in the control tube, where normally there is complete hemolysis. Closer examination thereafter determines whether such serum has the aforesaid characteristics of myelomatosis serum.

In the course of complement fixation tests (Wassermann tests—tests for the gonococcus) during the past two or three years, twenty-seven serums proved to be anticomplementary to a marked degree and on the whole to possess the properties described.

Each of these was heated to eight different temperatures from 54 to 68 C. (table 1) for ten minutes and then titrated. In every case it was thus possible to determine the temperature for the maximum fixation and the coagulation temperature.

Table 1 contains the data on complement fixation with serum 4. The figures represent the degree of hemolysis. One hundred equals total hemolysis, 0 no hemolysis, and the intermediate figures the various percentages. The total volume 0.5 cc. minus the quantity of complement equals the minimum hemolytic dose. Thus the optimum of serum 4 is 58 C. and the fixability 0.000001.

In addition, a determination of the protein content of each serum was made by Kjeldahl's method [4] and a formol-gel test performed. For every patient particulars were secured of the diagnosis and of the various examinations made to support it.

TABLE 2.—*Summary of Cases* *

				Anticomplementary Property of Serum						Serum Protein			Myelomatosis Verified by				
					Maximal Fixability and Temperature for Obtaining This												
Case	Sex	Age	Native	After Heating to 54 C., Minimal Fixing Dose, Cc.	Minimal Fixing Dose, Cc.	Temperature, C.	Coagulation Temperature, C.	Sedimentation Rate, Mm.	Formol-Gel Reaction, Positive After	Total, Mg. per 100 Cc.	Globulin, %	Bence Jones Protein in Urine	Sternal Puncture	X-Ray Examination	Autopsy	Death	Diagnosis
1	♂	51	—	0.002	0.00001	56	..	153	45 sec.	10.20	70	—	..	+	+	+	Myelomatosis
2	♀	62	—	0.002	0.000003	60	62	154	15 sec.	9.13	52	—	..	+	..	+	Myelomatosis
3	♀	62	—	0.0083	0.000003	60	63	110	2 hr.	8.61	58	—	+	+	..	+	Myelomatosis
4	♀	61	—	0.0009	0.000001	58	60	154	2 sec.	9.83	77	+	+	+	..	+	Myelomatosis
5	♂	70	—	0.025	0.000005	62	64	50	24 hr.	7.00	60	—	+	..	..	+	Myelomatosis
6	♀	73	—	0.025	0.000003	60	62	109	15 sec.	12.45	79	—	+	+	+	+	Myelomatosis
7	♀	41	—	0.025	0.000001	62	64	167	2 sec.	15.85	80	+	..	+	+	+	Myelomatosis
8	..	..	—	—	0.000001	62	64	144	15 sec.	8.25	70	+	+	+	+	+	Myelomatosis
9	♂	61	..	..	0.000001	60	..	149	2 sec.	13.85	..	+	+	+	+	+	Myelomatosis
10	♀	61	..	0.025	0.00001	62	64	104	4 min.	9.51	67	—	+	+	+	+	Myelomatosis
11	♂	76	—	—	0.000003	58	60	112	30 sec.	10.40	71	—	+	+	+	+	Myelomatosis
12	♂	47	—	—	0.025	58	66	125	10 sec.	10.85	68	—	(+)	+	..	+	Myelomatosis
13	♀	44	—	0.0083	0.00003	58	60	87	14 min.	9.05	63	—	..	+	..	+	Spontaneous fracture
14	♂	74	—	—	0.0001	64	70	102	30 sec.	10.80	73	+	..	—	(+)	+	Myelomatosis ?
15	♀	64	—	0.025	0.000003	64	66	80	10 sec.	11.32	76	—	..	+	..	+	Spontaneous fracture
16	♂	65	—	.....	0.000003	58	..	61	24 hr.	8.32	63	—	..	+	..	+	Myelomatosis ?
17	♀	53	—	0.025	0.000001	60	62	99	30 min.	8.00	50	+	..	—	(+)	+	Ovarian cyst
18	♀	62	—	0.0083	0.000001	58	64	132	24 hr.	7.60	59	+	..	—	..	..	Anemia
19	♂	63	—	0.0009	0.00001	56	58	3	—	7.06	47	—	..	..	..	..	Nephrolithiasis
20	♂	62	—	0.0009	0.0001	58	68	58	—	6.22	40	—	—	—	..	..	Hematuria
21	♀	56	—	0.0083	0.00003	60	66	26	—	8.05	50	?	..	..	..	+	Mb. cord.; albumin in urine
22	♂	64	—	0.025	0.0003	58	66	20	2 hr.	7.20	52	..	..	—	..	..	Mb. cord
23	♂	76	—	—	0.00001	62	66	5	—	6.05	57	—	..	—	..	..	Pityriasis
24	♀	..	—	—	0.0001	64	66	7	3 min.	9.40	53	—	..	..	..	..	Venereal lymphogranuloma
25	♀	58	—	0.0009	0.0003	54	66	7	—	7.00	45	—	..	..	..	..	Colitis
26	♂	57	—	—	0.0028	60	66	13	—	5.85	..	?	..	..	..	..	Paralysis agitans
27	♀	53	—	0.0083	0.000001	60	66	5	—	6.80	40	—	..	..	..	..	Anaemia simplex

* A minus sign means a negative observation. Two periods indicate that no examination was made. I have previously referred to patients 1, 2, 5, 4, 11, 13, 16, 18 and 19.[2] Aage Grut (Ugesk. f. læger **100**: 85, 1938) has referred to patient 9 and H. E. Nielsen (Hospitalstid. **81**: 589, 1938) to patient 10. Dr. Jens Bing performed some of the protein analyses. Serum from patient 8 was sent by Dr. Jetzer of Basel, Switzerland. Patient 18 died during July 1939, after having been ill for three years, finally complaining over severe pain in the bones.

From table 2 it appears that:

1. Of twenty-seven patients with anticomplementary serum, myelomatosis was verified in thirteen (1-13), the examination of five (14-18) gave very suggestive results and nine (19-27) presented no sign of myelomatosis (nor were they all thoroughly examined for it).

2. All patients for whom the diagnosis of myelomatosis was certain or probable had increased serum globulin, a positive formol-gel reaction and a high sedimentation rate.

3. With anticomplementary serum and no changes in the serum protein the diagnosis of myelomatosis is less probable.

4. Serum from most patients with myelomatosis has a low coagulation temperature (about 60 or 62 C.).

2. Jersild, Mogens: Ugesk. f. læger. **98**: 583, 1936. Footnotes 3 and 5.

3. Jersild, Mogens: (a) Ztschr. f. Klin. Med. **130**: 670, 1936.

4. Henriques, V., and Klausen, U.: Biochem. Ztschr. **254**: 414, 1932.

5. The temperature for the optimum fixability was about 60 C. for both groups of patients.

6. Bence Jones protein was found in the urine of only seven patients.

7. It is known that eighteen of the patients died a relatively short time after their serum was found to be anticomplementary.

Several serums with a fairly high increase in globulin, from patients with myelomatosis and with other diseases, were examined as to anticomplementary property, but the reaction failed even after they were heated to about 60 C.

Accordingly, the anticomplementary property of serum is a phenomenon found more frequently with an increase in globulin but not a regular consequence of it.

In the anticomplementary serums there must be a particularly labile proteinaceous substance of which the character has not been defined. Ultracentrifuging by the Svedberg method did not show Bence Jones protein in such serum, whereas there was a peculiar dissociability on dilution.[5]

SUMMARY

Of twenty-seven patients with anticomplementary serum, thirteen definitely and five probably had myelomatosis. The reaction occurs only after the serum is heated to from 56 to 60 C., and a considerable increase in globulin is often found; the coagulation temperature of the serum is often low.

SIMPLE TACHYCARDIA IN CHILDREN

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AND
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The significance of tachycardia is difficult to determine in children; it may be the result of organic heart disease or of a functional disturbance of little importance. The normal variations in cardiac rate in children extend over wide limits and emotional stimuli readily increase the rate. Occasionally tachycardia which is not associated with infection or heart disease may persist for long periods and be a cause of alarm to both the patient and the physician. Over a period of years we have observed ten children with rapid cardiac rates and we have attempted to discover the possible etiologic factors and the effects of the continued tachycardia on the health and development of these children.

LITERATURE

The literature on the subject of tachycardia, especially in childhood, is meager. Tezner [1] was impressed by the frequency with which tachycardia occurred in a group of 1,965 school children from 6 to 14 years of age. A cardiac rate above 110 a minute was noted in seventy-two, or 3.7 per cent, which was a higher incidence than that for hospitalized children. The initial examination was made when the patient was standing and it was thought possible that this factor together with that of excitement might have had some influence on the heart rate. When, however, the pulse rate was determined with the children in a sitting position the tachycardia persisted and when the children were in reclining positions only three had a reduction in the rate, so that it appeared unlikely that orthostatic factors caused the rapid rates. Only two of the group of seventy-two patients had evidence of organic heart lesions. The blood pressure varied between 110 and 115 systolic and 70 and 80 diastolic. Sinus arrhythmia was common, but the electrocardiograms were otherwise normal. In response to an exercise test of bending the knees from ten to fifteen times the cardiac rate increased on an average of from ten to fifteen beats a minute and returned to the initial rate within three minutes. Subjective signs of heart disease were absent and gymnasium work was well tolerated. Determinations of the basal metabolic rates were made for three children, and one had a slight elevation above normal. Pressure over the eyeballs usually caused a reduction in the heart rate but no change occurred with pressure of the vagus nerve. Some of the children with tachycardia were of the vasolabile neuropathic type and they appeared asthenic and pale, perspired readily and had frequent complaints of various types. Many other children with these characteristics did not have tachycardia but the author expressed the belief that the heart rates of children are often greatly influenced by hyperactivity and psychic stimulation.

A single instance of tachycardia in a 10 year old girl was reported by Hutinel, Lebée and Testart.[2] This child had a constant rate of 130 a minute with no other evidence of organic heart disease. She was excitable but slept well and her general health was good. There were no signs of thyroid disease or disturbance of the sympathetic nervous system and the basal metabolic rate was normal. Tachycardia in soldiers during the war of 1914-1918 attracted considerable attention and the subject has been reviewed by Musser,[3] Barringer [4] and Leconte and Tisné.[5]

The normal variations of pulse rate in children and the greater lability in response to excitement make the diagnosis of tachycardia more difficult. Burlage [6] observed that the average pulse rate of girls 9 years of age was 98.5 a minute and that with advancing age the rate became slower. Between the ages of 12 and 15 years the average rates were from 87.5 to 92.7 a minute. In nonmenstruating girls, the pulse rate was most closely correlated to height, less so to age and least of all to weight. In menstruating girls the rates were most closely correlated to age, less to weight and not at all to height.

In a review of the pulse rates under basal conditions at various age levels Sutliff and Holt [7] noted that the average pulse rates of girls were higher than those of boys from the age of 10 years onward and that adult levels of from 62 to 69 beats a minute were not reached until the age of 20. The variability of the heart rate was much greater in children than in adults. Lincoln [8] found that the average heart rates of boys aged from 6 to 12 years were from 86 to 79 a minute when they were in horizontal positions and from 95 to 82 in vertical positions, with standard deviations of from 7.8 to 11.6 in various age groups. The heart rates determined with

5. Jersild, Mogens, and Pedersen, K. O.: Acta path. et microbiol. Scandinav. **15**: 426, 1938.

From the Children's Hospital Research Foundation and the Department of Pediatrics, University of Cincinnati College of Medicine.

1. Tezner, O.: Ueber die Tachycardie der Schulkinder, Med. Klin. **24**: 1117-1120 (July 20) 1928.

2. Hutinel, J.; Lebée, L., and Testart, R.: Deux cas de maladie de Basedow chez l'enfant et un cas de tachycardie avec métabolisme normal, Bull. Soc. de pédiat. de Paris **25**: 50-51 (Jan.-Feb.) 1927.

3. Musser, J. H.: Tachycardias of Soldiers, Am. J. M. Sc. **155**: 883-900 (June) 1918.

4. Barringer, T. B.: Tachycardia of Unknown Origin, Arch. Int. Med. **22**: 804-814, 1918.

5. Leconte, M., and Tisné: Fate of War Tachycardias, Bull. et mém. Soc. méd. d. hôp. de Paris **47**: 1180-1185 (July 27) 1923.

6. Burlage, S. R.: Blood Pressures and Heart Rate in Girls During Adolescence, Am. J. Physiol. **64**: 252-284 (April) 1923.

7. Sutliff, W. D., and Holt, Evelyn: Age Curve of Pulse Rate Under Basal Conditions, Arch. Int. Med. **35**: 224-241 (Feb.) 1925.

8. Lincoln, E. M.: Hearts of Normal Children: Clinical Studies, Including Notes on Effort Syndrome, Am. J. Dis. Child. **35**: 398-410 (March) 1928.

the children in horizontal positions were generally from two to five beats faster for girls than for boys of the same age. The greatest differences usually occurred at the age of puberty.

Great variations of pulse rate during the course of a single day have been observed by Sutherland and McMichael.[9] In a girl 11 years of age they noted that in the early-morning when she was asleep the rate was 30 beats a minute slower than in the afternoon when she was enjoying active play. In their opinion the greatest variations of pulse rate occurred in children of nervous and excitable temperaments and in patients with rheumatic fever.

In experimental studies, Stewart and Crawford[10] found that simple tachycardia with a rate of from 250 to 400 a minute induced for one hour by electrical stimulation of the auricles of dogs did not materially change the oxygen saturation or the volume flow of the blood. The size of the heart, as determined by roentgenograms, decreased during this period of induced auricular tachycardia. It was concluded that the efficiency of the heart was as great during periods of such tachycardia as during the time when the heart rate was normal.

OBSERVATIONS

Ten children, all girls but one, with persistent tachycardia but without evidence of cardiac disease or any other specific illness were observed in our cardiac clinics for a period of from one to seven years. These clinics were held during the morning hours and the pulse rates were counted when the children were relaxed and in a recumbent position. Since the children had become accustomed to visiting the clinic and were well acquainted with the personnel, excitement and fear should not have been responsible for the tachycardia. One child was 6 years of age when the symptom was first noted and her heart rate was 140 a minute; the other children were from 10 to 12 years of age when first observed. Persistent pulse rates of 115 or more a minute were considered to be abnormal, although in the majority of instances the rate was from 120 to 140. This group of ten children constitute only 1.3 per cent of the 782 children who have attended the cardiac clinics because of potential or actual heart disease.

The predisposing factors were difficult to determine. Since eight of the nine girls were preadolescent, some temporary imbalance of the endocrine system might be considered as causative. In two instances nervousness and tremor of the extended fingers suggested thyroid disturbance but the basal metabolic rates were only slightly elevated above normal. The tachycardia lasted for several months before and after the onset of menstruation in six girls. The only boy in the group, 11 years of age, became obese while the tachycardia was present but had no other signs of pituitary or thyroid disturbance. Two girls were definitely underweight when first seen. One girl had had scarlet fever about six months before the tachycardia was noted but none of the other patients had had any serious illness within two years before the rapid pulse rate developed. In four instances rheumatic fever, scarlet fever or diphtheria had occurred from two to seven years previously.

A symptom of damage to the heart, other than the tachycardia, occurred in only one case and this was the indefinite one of dyspnea on exertion. The majority of the children were entirely free from symptoms of any type and had been referred to the clinics because of the tachycardia, which had been detected on routine physical examination.

Examination of the heart gave practically negative results in all cases. Murmurs of little significance, probably functional or accidental, were heard in four instances, but even this abnormality disappeared completely within one or two years. The teleoroentgenogram of one child suggested some cardiac enlargement but the roentgenologic and fluoroscopic examinations of the other children showed no abnormalities in cardiac shape and size. The electrocardiograms did not demonstrate any striking peculiarities in any instance.

REPORT OF CASES

CASE 1.—G. O., a white girl aged 11½ years, who had a pulse rate of 130 a minute in the reclining position, had had several attacks of sore throat and occasional shortness of breath on exertion. The heart sounds were normal except for a splitting of the first sound at the apex. A soft systolic murmur was heard at the apex and aortic areas when the patient was first examined, but this disappeared after a few months. There was a slight tremor of the fingers when they were extended, and the thyroid gland was palpable but not enlarged. No other evidence of hyperthyroidism could be found and the basal metabolic rate varied between −17 and +4 per cent at this time. Roentgenograms showed no cardiac enlargement and the electrocardiograms disclosed nothing abnormal except a sharp and biiurcated P wave in lead 2 and an inverted T wave in lead 3.

The pulse rate was from 120 to 160 at numerous examinations during a period of three years and then decreased, being from 90 to 108 for the next four years. During this time the patient grew and developed normally and her nutrition was excellent.

At the age of 13 years her basal metabolic rate was +15 per cent and at 18 years it was +0.5 per cent.

CASE 2.—R. M., a white girl aged 12 years, had been "nervous" for several weeks. Her past history revealed nothing significant except an attack of diphtheria at the age of 5 years. The heart rate was 120 a minute in the reclining position. There were no murmurs, the size of the heart in the teleoroentgenograms was normal and the electrocardiograms disclosed nothing abnormal except the sinus tachycardia. There was no evidence of thyroid disease. At the age of 12½ years, five months after her first examination, menstruation began. The pulse rate in the reclining position dropped to 100 within the next three months and varied between 88 and 104 during the next one and one-half years. An electrocardiogram made when the patient was 14½ years of age revealed nothing abnormal except a tendency to right axis deviation.

CASE 3.—H. D., a Negro girl aged 10 years, had a pulse rate of 104 a minute in the reclining position when first examined; this became as rapid as 120 during the following year. No history of previous infections could be obtained. There were some enlargement of the thyroid gland, hoarseness, a slight tremor of the extended fingers and a soft murmur at the apex. The first basal metabolic rate, taken when she was 10 years old, was ±0, and in the following year the rate was +21 per cent. During one and one-half years of observation the symptoms continued in mild form, the murmur disappeared and the child gained weight but the pulse rate persisted at levels from 100 to 120. She is still under observation.

CASE 4.—D. R., a Negro girl aged 12 years, who had been in good health except for an attack of pains in the joints when she was 10 years of age, when she was first seen had a pulse rate of 120 a minute in the reclining position. The heart was otherwise normal and her nutrition was good. On fluoroscopic examination the size and configuration of the heart appeared normal. The electrocardiogram indicated some slurring of the ST segments in leads 1 and 2. There was no clinical evidence of thyroid disturbance but the basal metabolic rate at the age of 12½ years was +19 per cent. On occasions the heart rate became slower for a minute or less but this curious alternation of tachycardia and bradycardia could not be explained. With

9. Sutherland, G. A., and McMichael, J.: Pulse Rate and Range in Health and Disease During Childhood, Quart. J. Med. 22:519-529 (April) 1929.

10. Stewart, H. J., and Crawford, J. H.: Effect of Tachycardia on the Blood Flow in Dogs, J. Clin. Investigation 2:449-463 (Dec.) 1926; Effect of Regular and Irregular Tachycardias on the Size of the Heart, ibid. 3:483-490 (Feb.) 1927.

the onset of menstruation one year later the patient's heart rate became somewhat slower but was still 108 in both reclining and standing positions.

CASE 5.—R. R., a white girl aged 10 years, who had had scarlet fever at the age of 5 years but otherwise had been in good health, had a pulse rate in the reclining position of 102 a minute and a blood pressure of 140 systolic, 70 diastolic. The pulse rate subsequently rose to 120. An inconstant murmur heard at the base of the heart was considered to be functional. The electrocardiogram was normal. The basal metabolic rate at the age of 11 years was +6 per cent. During a period of observation of four years the pulse rate varied between 94 and 120. Menstruation began at the age of 14 years and after that time the heart rate declined to a maximum of 94 in the reclining position and the blood pressure to 124 systolic, 68 diastolic.

CASE 6.—H. H., a white girl aged 12 years, who had been told by her family physician at the age of 11 years that she had a rapid heart rate, had a pulse rate in the reclining position of 132 a minute but an otherwise normal heart. There was no history of important infection. The electrocardiogram showed a T wave of low amplitude in lead 2 and an inverted T wave in lead 3. The basal metabolic rate was —2.7 per cent. During a period of observation of one year the pulse rate was from 120 to 136, and she is still under observation.

CASE 7.—T. H., a white boy aged 11 years, who had had epistaxis and pains in the joints at the age of 6 years and occasional very mild arthritic attacks since that time, had a pulse rate of 116 a minute in the reclining position and an otherwise normal heart. In the teleoroentgenogram the heart seemed to have a rather straight left border but fluoroscopic examination did not demonstrate any abnormality of size or configuration. Electrocardiograms disclosed nothing abnormal, and the basal metabolic rate was —8 per cent. His nutrition was excellent and within the next four years he gained an excessive amount of weight and became somewhat obese. At the age of 12 and 13 years he was from 19 to 23 per cent above the expected weight for his height and age. In the next two years his weight was only from 10 to 14 per cent above average. The heart rate continued between 110 and 120 for about three years after he was first seen but finally decreased to 80.

CASE 8.—D. V., a white girl aged 11 years, had a heart rate of 120 a minute in the reclining position when first seen, about six months after an attack of scarlet fever. Auscultation of the heart gave normal results, and teleoroentgenograms showed no abnormalities. Electrocardiograms disclosed nothing abnormal except inversion of the T waves in lead 3. The basal metabolic rate was —11 per cent. The high pulse rate continued for several months but by the end of one year the rate was from 76 to 94 and it remained within normal limits through the succeeding two years of observation.

CASE 9.—P. F., a white girl aged 10 years, had a pulse rate of 132 a minute in the reclining position. Her medical history was irrelevant. The heart appeared normal on auscultation and fluoroscopic examination. In the electrocardiogram the T and P waves in lead 3 were inverted. Her nutrition was below average. The pulse rate slowly decreased to an average of 105 over a period of three years and her nutrition improved.

CASE 10.—E. F., a white girl aged 6½ years, had a pulse rate of 140 a minute in the reclining position. There was no history of important illness. An inconstant murmur was audible at the apical region for about one year. The teleoroentgenogram suggested a slight enlargement of the transverse ventricular diameter, and on the electrocardiogram the ST segments in leads 1 and 2 were somewhat slurred. The nutrition was poor. The tachycardia persisted for two years. The patient was in the hospital for observation for one week during this time and the pulse rate in bed was between 100 and 120. A slight elevation of temperature at this time could not be explained. The tuberculin tests and chest plates disclosed nothing abnormal. The basal metabolic rate was +5 per cent.

COMMENT

The treatment prescribed for these children was adequate rest, usually for eleven or twelve hours during each twenty-four hour period. As a precautionary measure the more vigorous competitive sports, such as swimming, racing and basket ball, were prohibited until it was certain from repeated observations and tests that the rapid heart rate was not the result of organic heart disease. Other children, not included in this report, who had only initial symptoms of tachycardia, soon lost these symptoms when elements of fear and excitement were removed. In the group in which the heart rate remained high, the temporary changes associated with adolescence seemed to be possible etiologic factors in many instances.

SUMMARY

Of ten children with persistent sinus tachycardia and without any evidence of infection or organic heart disease, eight were girls from 10 to 12 years of age and one was a girl of 6 years. Associated with the tachycardia were possible symptoms of mild thyroid disease in two girls, the onset of menstruation in six, and malnutrition in two. The one boy in the series was obese. Repeated observation of these children was necessary to make sure that the tachycardia was not a temporary emotional response and that it was not due to organic disease. During periods of from one to seven years these children had no signs of circulatory failure, and the heart rate frequently returned to normal levels with advancing age.

From observation of these children over a period of years it can be concluded that the tachycardia did not impede normal growth and nutrition, that it did not produce subjective symptoms of any importance and that it tended to disappear within a few years.

Clinical Notes, Suggestions and New Instruments

INFLUENZAL MENINGITIS WITH BACTEREMIA TREATED WITH SULFAPYRIDINE: RECOVERY

TOM R. HAMILTON, M.D., AND FRANK C. NEFF, M.D., KANSAS CITY

During the period of clinical trial of Dagenan [1] at the University of Kansas Hospitals a 2 year old girl with meningitis was sent into the children's department by the family physician [2] for assistance in identifying the type of organisms which he had found in the spinal fluid. With a cell count of 5,000 per cubic millimeter and many organisms visible on the stained slide, the physician found it difficult to identify the various forms which were present but thought that they might be pneumococci and hoped that they might be amenable to serum treatment. We report the case with the rationale of the diagnosis and its treatment with sulfapyridine. In the absence of any known specific therapy we had hoped that this drug might be effective in what we found to be influenzal meningitis with bacteremia.

REPORT OF CASE

Phyllis B., aged 2 years, was observed by the family physician on March 5, 1939, to have symptoms of illness which had developed during the previous night; these were vomiting, high fever, stupor and difficulty of awakening. The temperature was 103 F. and the respiratory rate 72 per minute. Prostration was so severe that the child was not disturbed by the examination. A moderate stiffness of the neck was found, but pneumonia seemed undoubtedly to be localized in a restricted area about 6 cm. in diameter, which suggested that pneumonia with meningismus would explain the illness.

From the Departments of Pathology and Pediatrics, the School of Medicine, University of Kansas, Kansas City, Kan.

1. Sulfapyridine (Dagenan) was furnished for clinical investigation by Merck & Co.

2. The referring physician is Dr. H. M. Benning, Waverly, Kan. As soon as convalescence seemed certain, the girl was sent back from the hospital to her home in Waverly, where he concluded the treatment with the drug.

The next day the chest was clear but the neck was rigid and the Kernig sign was present; a spinal tap yielded cloudy fluid, a cell count of 5,000, mostly polymorphonuclear leukocytes and abundant micro-organisms.

The child was then transported 100 miles in an automobile and admitted to the University of Kansas Hospitals March 7. There were high fever, prostration, opisthotonos, cervical rigidity and positive Kernig and Brudzinski signs. A spinal puncture was performed at once, yielding a peculiar flaky, ground-glass fluid, smears of which showed numerous cells, of which 87 per cent were polymorphonuclear and many micro-organisms of gram-negative, pleomorphic bacillary forms. The spinal fluid sugar was 9 mg. and the globulin test was positive. A blood culture was taken soon after the spinal puncture.

Fewer of the same organisms were seen on smears of spinal fluid drawn on the second hospital day, at which time the cell count was 35,000 with 96 per cent polymorphonuclear leukocytes.

The patient appeared to be much better on the fourth day, at which time the temperature remained below 100. The patient was dismissed March 13, apparently well clinically except for slight fever of 100.4 F. on the seventh hospital day (the ninth day of the illness).

COMMENT

We knew of no published report of this type of meningitis in which treatment with sulfapyridine had been successful, but it seemed advisable to try it, especially since serum therapy offered little benefit. Barnett and Hartmann and their co-workers [3] mentioned two fatal cases of influenzal meningitis in which this drug had been used but gave no details.

The accompanying table shows the clinical and laboratory data under hospitalization, with the bacteriologic changes and sulfapyridine dosage.

The diagnosis of Haemophilus influenzae was made on the following facts: (1) the pleomorphic type of gram-negative bacilli on direct smears of spinal fluid; (2) the dew drop type of colony growing delicately and yielding the same organisms; (3) the fastidious growth with quick death of some cultures; (4) the production of indole.

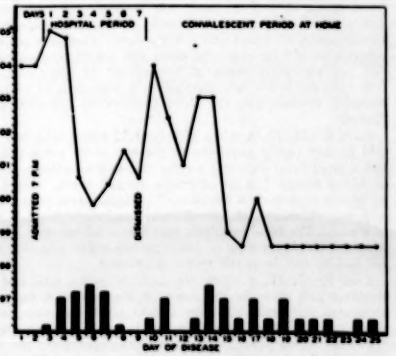
Clinical and Laboratory Data

Hospital day	1	2	3	4	5	6	7
Blood count							
Hemoglobin	87%	....	....	80%	80%	....	80%
Red blood cells, millions	4.9	....	....	4.7	4.3	....	4.2
White blood cells	21,750	22,150	10,700	11,100	11,700	....	10,000
Polymorphonuclears	80%	74%	51%	62%	56%	....	60%
Spinal fluid							
Cells	250	35,000	....	....	300	....	225
Polymorphonuclears	87%	96%	....	....	72%	....	21%
Globulin	Pos.	....	....	....	Pos.	....	Pos.
Sugar	9 mg.	....	....	....	....	....	55 mg.
Bacteriology							
Spinal fluid							
Smear							
Gram-negative bacilli	Many	Few	....	....	None	....	None
Culture							
Haemophilus influenzae	Pos.	Pos.	....	....	Neg.	....	Neg.
Indole	Neg.	Pos.	....	....	....	....	....
Blood culture positive for Haemophilus influenzae							
Temperature (daily high)	103.8	104.8	101.6	99.8	100.4	100.6	101.4
Sulfapyridine (daily amount in grams)	0.25	1	1.25	1.5	1.25	0.25	0
Supportive treatment							
Dextrose 2.5% solution	....	....	....	1	....	....	....
Blood transfusion	....	60 cc.	....	60 cc.	....	....	....

The etiologic relationship of the organism to the meningitis is based on (1) the positive smears and cultures of two consecutive spinal fluids at the height of the disease, which became negative with improvement; (2) the spinal fluid sugar of 9 mg. on admission, rising to a normal of 55 mg. on dismissal; (3) the blood culture on admission yielding the same organism, and (4) the indole production by the organism.

The efficacy of sulfapyridine is suggested by the prompt recovery simultaneously from the clinical and the laboratory standpoint, without the use of specific serum. This is similar to the response of Teggart's [4] case with soluseptasine (a May and Baker preparation of the sulfonamide series) without serum.

The mortality rate of 96.4 per cent for influenzal meningitis was given by Neal and her associates [5] in 1934. A rate of 72 per cent was found by Silverthorne, Fraser and Snelling [6] from 1930 to 1937, using intrathecal anti-influenzal horse serum and guinea pig complement.



Temperature curve and daily amounts of sulfapyridine. On the eighth and ninth days of the disease the administration of sulfapyridine was interrupted because of the disappearance of organisms from the spinal fluid, the well-being of the child and the falling of the temperature; the child was sent home from the hospital with a quantity of sulfapyridine to be used if necessary. When she reached home a relapse in the fever occurred, so the drug was again used until the temperature dropped to normal on the fifteenth day of the disease and within two days thereafter remained constant at the normal level.

Sulfanilamide was shown by Long and Bliss [7] to be effective in inhibiting Haemophilus influenzae in vitro in a concentration of 1 : 10,000.

Prontosil alone was able to lower slightly the mortality of mice injected with Haemophilus influenzae, while immune serum alone could not lower it satisfactorily, whereas immune serum plus prontosil lowered it to from 13 to 33 per cent, according to Povitsky.[8]

Serum and sulfanilamide in influenzal meningitis have been advocated by Neal and Appelbaum.[5] Young and Moore [9] report a case cured by serum and sulfanilamide, although culture of the spinal fluid was positive as late as the thirty-first day, and the patient was hospitalized for forty-five days with an elevated temperature.

We are aware that filtrable virus is a possibility in the etiology of influenzal infections, although not necessarily in meningitis. It was concluded by Béclère [10] in the analysis of the Leningrad work of 1936 that clinical symptoms are to be attributed to the toxins of Pfeiffer's bacillus alone. Moderate leukocytosis was noted in the series reported.

Chemotherapy, in any event, is none the less logical in this condition, and one might cite the work of Dochez and Slanetz,[11]

3. Barnett, H. L.; Hartmann, A. F.; Perley, Anna M., and Ruhoff, Mary B.: The Treatment of Pneumococcic Infections in Infants and Children with Sulfapyridine, J. A. M. A. **112**: 518 (Feb. 11) 1939.

4. Teggart, B.: Influenzal Meningitis Treated with Soluseptasine and Lumbar Puncture: Recovery, Brit. M. J. **1**: 1365 (June 25) 1938.

5. Neal, Josephine B.; Jackson, H. W., and Appelbaum, Emanuel: Meningitis Due to the Influenza Bacillus of Pfeiffer (Haemophilus Influenzae), J. A. M. A. **102**: 513 (Feb. 17) 1934.

6. Silverthorne, Nelles; Fraser, D. T., and Snelling, C. E.: Influenzal Meningitis, J. Pediat. **10**: 228 (Feb.) 1937.

7. Long, P. H., and Bliss, Eleanor A.: Para-Amino-Benzene-Sulfonamide and Its Derivatives, J. A. M. A. **108**: 32 (Jan. 2) 1937.

8. Povitzky, Olga R.: Immune Serum and Prontosil Combined Treatment for Protection of Mouse Against Fatal Dose of Haemophilus Influenzae Meningitis, New York State J. Med. **37**: 1748 (Oct. 15) 1937.

9. Young, R. H., and Moore, C.: Influenzal Meningitis: Report of Case Treated with Anti-Influenzal Serum and Sulfanilamide, Arch. Pediat. **55**: 282 (May) 1938.

10. Béclère, A.: Influenza: revue générale: le rôle respectif du bacille de Pfeiffer et du virus spécifique dans l'influenza humaine, Presse méd. **45**: 1203 (Aug. 21) 1937; (abstr. Year Book of General Medicine, 1938, p. 32).

11. Dochez, A. R., and Slanetz, C. A.: Treatment of Canine Distemper with Chemotherapeutic Agent Sodium Sulfanilyl Sulfanilate, Science **87**: 142 (Feb. 11) 1938.

who treated experimental and spontaneous distemper virus disease, with the conclusion that sodium sulfanilyl sulfanilate seems to be the first chemical agent with definite therapeutic action on filtrable virus infection. They felt that its range of activity in virus disease is yet to be explored. One of us (T. R. H.) has treated a dog which appeared to have distemper, at the Hixon Laboratory, with sulfapyridine, 2 Gm. daily for five days. The dog was much improved in less than twenty-four hours and seemed normal in four days.

A broad concept of general immunity was offered by Locke [12] based on fitness ratings which give an index of the capacity for resistance, obtained from studies on rabbits and man. Among animals with experimental pneumococcic infection treated with sulfanilamide in the low rating group, 25 per cent recovered without supportive treatment and 100 per cent (in a small series) when supported by vitamin B, or liver extract. The correlation of this with the influenzal study is that the basis of lowered resistance in Locke's [12] study in man was frequency of the common cold. Those with lower ratings showed a marked susceptibility and those with high ratings a relative immunity.

Any superiority of sulfapyridine in its effectiveness over sulfanilamide in pneumococcic and possibly influenzal infection of the meninges must be in the addition of pyridine, which is the chemical difference between the two drugs.

Pyridine is of special interest because of its close relationship to the vitamin B group. The speed of action of sulfapyridine is in keeping with the rapid penetration through the body of pyridine in acidified form as nicotinic acid. [13]

The mode of action of sulfapyridine in influenzal infection is unfortunately highly speculative and inferential.

The patient studied became afebrile on the sixteenth day of illness, during which time sulfapyridine had been used in somewhat larger doses at first and finally in about 0.5 Gm. doses daily. Recovery has been complete without sequelae.

PREVENTION OF USUAL SYMPTOMS FOLLOWING ENCEPHALOGRAPHY BY THE PRELIMINARY INJECTION OF ATROPINE SULFATE

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Harvey Cushing [1] reported that when he injected 1 cc. of solution of posterior pituitary into the ventricles of a human brain the patient exhibited intense flushing of the face, profuse perspiration, retching and vomiting, salivation and a marked fall in the body temperature. Cushing was able to prevent these reactions by the injection of 1 mg. of atropine sulfate subcutaneously.

It was realized that many of the symptoms during and following the procedure of encephalography were remarkably similar to those produced by Cushing in the manner stated. Accordingly in 1937 my associates and I began the routine use of atropine sulfate before encephalography [2] and since then we have used one-fiftieth grain (1.3 mg.) with gratifying results in more than 100 encephalograms made of patients with epilepsy and other neurologic conditions.

METHOD

The night before encephalography the adults are given 10 grains (0.6 Gm.) of chloral hydrate and from 20 to 30 grains (1.3 to 2 Gm.) of sodium bromide. On the morning of encephalography the same dose is given, and one-half hour before injection of air 2 grains (0.13 Gm.) of soluble phenobarbital is given by hypodermic. In place of the phenobarbital we may use a 50 milligram scale of tribromethanol in amylene hydrate by rectum. Morphine and its derivatives are not used because of respiratory depression. Fifteen minutes before the injection of the air one-fiftieth grain (1.3 mg.) of atropine sulfate is given subcutaneously. Children receive the same hypnotics in doses compatible with age. Those above 5 years of age are give 1/100 grain (0.65 mg.) of atropine sulfate. We have not used it in infants because of the uncertain effects of large doses.

CONCLUSION

In more than 100 cases we have found that the subcutaneous injection of 1/50 grain (1.3 mg.) of atropine sulfate about fifteen minutes before starting encephalography will decrease considerably such symptoms as excessive perspiration, nausea and vomiting, and headache. This amelioration of symptoms is seen not only during the procedure but also during the post-injection convalescent period.

12. Locke, A.: Lack of Fitness as Predisposing Factor in Infections of Type Encountered in Pneumonia and in Common Cold, J. Infect. Dis. 60: 106 (Jan.-Feb.) 1937. Locke, A.; Locke, R. B.; Braddon, R. J., and Mellon, R. R.: Fitness, Sulfanilamide and Pneumococcus Infection in Rabbit, Science 86: 228 (Sept. 3) 1937.

13. Sulfapyridine in Pneumonia and Other Infections, editorial, South. M. J. 32: 336 (March) 1939.

From the Department of Neurology and Neurosurgery headed by Dr. Temple Fay, Temple University Hospital and School of Medicine.

1. Cushing, Harvey: Papers Relating to the Pituitary Body, Hypothalamus and Parasympathetic Nervous System, Springfield, Ill., Charles C. Thomas, 1932, pp. 62 and 76.

2. Scott, Michael: Curve for the Sugar Content of the Blood Following Encephalography: Comparison with the Usual Curve for Dextrose Tolerance, Arch. Neurol. & Psychiat. 38: 985-991 (Nov.) 1937.

Special Article

THE PHARMACOPEIA AND THE PHYSICIAN

WHEN ARE DRUGS USEFUL IN PULMONARY TUBERCULOSIS?

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This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Drug therapy in pulmonary tuberculosis embraces three distinct fields: (*a*) the treatment of symptoms, (*b*) the treatment of complications and (*c*) the treatment of associated diseases.

The treatment of the complications and associated diseases leads into every province of medicine. To meet the indications as they arise, the sanatorium of today has become a highly specialized institution with a staff of visiting consultants capable of treating competently all nontuberculous conditions, surgical and medical, that afflict the consumptive in addition to the "primary malady."

TREATMENT DIRECTED AGAINST THE CAUSE

Prophylaxis centers largely, if not entirely, on control of the open case and includes such measures as separation of the contact child, collapse therapy, the compulsory report, school surveys to detect the primary source of infection, legislative measures directed both toward control in the human being and such coercive legislation as exemplified by pasteurization ordinances, score card inspection of dairies and tuberculin testing of cattle.

In prophylaxis too one has to consider, and consider seriously, the BCG vaccine, which, although it has found general application and favor abroad, has as yet not reached far beyond the borders of research in this country.

Apart from the possibilities of BCG and the mechanical specificity of collapse therapy, at present there is

no specific drug or vaccine for tuberculosis. Vaccines and tuberculins used in the past have been discontinued, largely because of the unsatisfactory results and danger of the severe local, focal or general reactions that tend to activate the disease and cause further dissemination.

Why is a specific agent still lacking? There is still a great void in our knowledge of the immunologic questions inherent in tuberculosis. The literature on the subject is all confusion, an array of controversial opinion largely due to failure to make a distinction between tuberculous infection and tuberculous disease. Tuberculous infection implies tissue reaction, namely tubercle formation brought about by implantation of the bacillus. Disease means growth and spread from the primary focus, bacillary activation accompanied by symptoms of absorption and the elaboration of such toxins as the tubercle bacillus forms through its metabolism in the tissues.

The reaction to the bacillus is uniform. There is no known immunity to infection. The constancy of this is seen in animals which are refractory to tuberculosis and rarely develop disease under natural conditions. Such animals show tubercle on inoculation; tubercle, it is true, that is usually nonprogressive. It is on this fact—constancy of reaction with variability in sequence—that Calmette and Guérin based their vaccine, a culture of bovine bacilli many generations old of markedly attenuated virulence but still alive. Attempts to produce immunity with dead bacilli had been tried many times but found to be without avail. Though the dead organisms did produce the specific tissue reaction, namely tubercle, they exercised no influence on immunity.

TREATMENT DIRECTED AGAINST THE PATHOLOGIC CONDITION

As far as is known, there is no medicine that acts directly on the tubercle bacillus in vivo or uniformly increases the defense reaction of the body. Henrichsen and Sweany [1] have experienced favorable results using gold sodium thiosulfate in approximately 50 per cent of cases of advanced tuberculosis with a stationary or progressive trend. Similar results have been reported by others. At the International Tuberculosis Congress at The Hague in 1932 the discussion on the subject seemed largely favorable.

Much, however, remains to be done with gold sodium thiosulfate. For the present it is admitted that the pathologic lesions are best controlled by collapse therapy, a measure which, from the mechanical standpoint, may be considered specific. Collapse therapy meets the prime indication—rest, a chapter in the treatment of tuberculosis which collapse has modified and confined.

THERAPY DIRECTED AT THE SYMPTOMS

Fresh air, good food, high caloric, high mineral and high vitamin diets stressing vitamins A, B, C and D, sunshine, heliotherapy for extrapulmonary lesions, postural change for drainage of cavities, rest in its various implications, complete bed rest, localized immobility through the medium of shot bags, corsets and other nonmedicinal or surgical procedures, psychic rest as well as physical, occupational therapy and other measures designed to complement rest of the body by promoting repose of the mind—this constitutes routine therapy.

1. Henrichsen, K. J., and Sweany, H. C.: Sanocrysin Treatment in Tuberculosis, Am. Rev. Tuberc. (supp.) **38**: 1 (Oct.) 1933.

I think of the pharmacologic action of drugs in tuberlosis according to the following classification:

1. Drugs that exercise their action by their elimination through the lungs, namely creosote and guaiacol.

2. Drugs that supposedly tend to influence fibrosis or stimulate the defense reaction of the body (e. g. gold sodium thiosulfate, still in the research stage, as described).

3. Drugs with a general tonic or alterative effect.

4. Drugs that have an action on the sympathetic nervous system.

5. Drugs acting on the demineralization theory of tuberculosis, such as calcium.

Drugs Eliminated by the Lungs.—In this group come creosote and its derivatives guaiacol, guaiacol carbonate, creosote carbonate, thiocol, guaiatonic, guaiacose and proposote. Regarding their action, Nammack and Tiber [2] state that guaiacol is not eliminated by the lungs if taken by mouth and have in consequence advised the intravenous method of administration. As a group, these drugs act on the bronchial secretion, diminish the amount of sputum and produce a change in its character, rendering it less purulent. In their work Nammack and Tiber confined themselves to pulmonary abscesses. It would seem reasonable to suppose however that, owing to their action on bronchial secretions, these drugs would help to clean up the bronchitis, bronchiectasis or abscesses frequently associated with tuberculosis, conditions often underlying the so-called protracted colds of the tuberculous patient.

Notwithstanding these results, substantiated by others, the Council on Pharmacy and Chemistry [3] announces that creosote and guaiacol have been omitted from New and Nonofficial Remedies. From the standpoint of specific or chemotherapeutic action the omission is perhaps justifiable; practically, however, these drugs most certainly appear to have a definite clinical value in the treatment of cough and sputum. It is necessary to remember, however, that they may be disturbing to the digestion.

Drugs That Tend to Influence Fibrosis.—The copper salts once thought effective in this respect and gold in its various combinations have been investigated and found wanting. Colloidal preparations of copper, gold and silver subcutaneously or intravenously are still being investigated, especially the gold sodium thiosulfate or sanocrysin of Möllgaard. Caution is indicated and overenthusiasm must be guarded against. The metallic substances produce an inflammatory reaction around the focus of disease much as does tuberculin. In the use of any metal in therapy, the physician may encounter a toxic action of the heavy metal in stomatitis, enterocolitis, dermatitis, nephritis or neuritis.

Drugs with a General Tonic or Alterative Effect.—In this class comes cod liver oil, the value of which lies in the vitamin and high fat content; fruit juices, and concentrated vitamin C.

Drugs That Have an Action on the Sympathetic Nervous System.—Iodine has its normal concentration highest in blood and is eliminated through the kidneys. In cases benefited by the use of iodine, I believe the improvement is due not to its chemotherapeutic value but to its action on the sympathetic nervous system, much in the same way that compound solution of iodine influences toxic goiter.

2. Nammack, C. H., and Tiber, A. M.: The Treatment of Lung Abscess by Means of Guaiacol Intravenously, J. A. M. A. **109**: 330 (July 31) 1937.

3. Guaiacol and Creosote Compounds, Reports of the Council on Pharmacy and Chemistry, J. A. M. A. **110**: 209 (Jan. 15) 1938.

In my experience the best results are seen in the sympathicotonic tuberculous individual with an acute condition presenting dilated or irregular pupils, flushed face, sweating, rapid pulse, tremor and anxious expression; in other words, the case simulating toxic goiter.

Results today are measured by the pathologic lesion as shown on x-ray examination and not, as in the past, by the yardstick of a clinical improvement which only too often meant nothing more than a temporary lessening of the toxemia and the swing of the clinical classification from C to A. The "repeaters" to the sanatorium were much more frequent in those days than they are today, when improvement in the lesion is charted by the x-ray examination and the extent of collapse.

Drugs Acting on the Demineralization Theory of Tuberculosis.—Those who adhere to a demineralization theory in tuberculosis administer calcium gluconate and calcium lactate, from 30 to 60 grains (2 to 4 Gm.) a day. Clinically, however, there is no evidence of loss of calcium, and calculations of blood calcium remain quite normal in the disease.

TREATMENT OF SYMPTOMS

Collapse therapy has taken the place of many of our old time drugs. The symptoms and physical abnormalities in pulmonary tuberculosis are many and the pathologic lesions diverse, including frequently in the same pulmonary lobule a simultaneous patchwork of exudation, caseation, ulceration, fibrosis and calcification. To meet such protean indications in full detail would strain half the pharmacopeia. I shall confine myself to the management of a few cardinal symptoms, including (*a*) symptoms of tissue destruction, (*b*) symptoms of toxemia and (*c*) symptoms of reflex origin as classified by Dr. Francis Pottenger.

Hemorrhage.—This subject is too vast to be handled in a few lines. I refer the reader to "The Therapy of Hemoptysis" by Dr. Bernard Fantus, director of Therapeutics of the Cook County Hospital, and Dr. Frederick Tice, president of the board of directors of the City of Chicago Municipal Tuberculosis Sanitarium, in THE JOURNAL.[4] However, it is necessary to emphasize the warning of Fantus and Tice on the indiscriminate use of morphine in the treatment of hemorrhage. Morphine, by decreasing the reflexes and abolishing the cough, tends to retain the secretions.

Cough.—The cause should be carefully determined. Cough is a physiologic response to irritation in either the lower or the upper respiratory system, including the nose, throat and bronchi. It may be of reflex origin due to pleurisy, pressure of mediastinal glands, mediastinal displacement, inflammation and foreign bodies in the ear, throat and the like.

Naturally the treatment will depend on the cause. When due to inflammation in the respiratory tract it performs a useful purpose in eliminating the irritative material, namely sputum, and should not be lessened unless excessive. It can be managed, however. The patient should cough with the glottis open in order to avoid stress, strain and excessive intrapleural and pulmonary pressures. He should restrain his cough until there is a sufficient amount of secretion collected to make the act productive. To prevent strain by gagging, hot water or milk is useful, aided by ammonium chloride or ammonium carbonate in suitable prescriptions. These expectorants are useful when the sputum is excessive or is associated with postural drainage in the presence of bronchiectasis. They may be given as in prescriptions 1 and 2.

PRESCRIPTION 1.—*Ammonium Chloride*

	Gm. or Cc.
Ammonium chloride	10
Syrup of glycyrrhiza	120

Mix and label: Teaspoonful in a half glassful of water every two hours.

PRESCRIPTION 2.—*Ammonium Carbonate*

	Gm. or Cc.
Ammonium carbonate	5
Distilled water	20
Syrup of acacia	60
Syrup of glycyrrhiza to make	120

Mix and label: Two teaspoonfuls in a half glassful of water every two hours.

For the dry, useless cough caused by the reflex irritation from pleurisy, mediastinal pathologic change or irritation in the upper respiratory tract, voluntary suppression of the cough is aided by avoiding the use of tobacco and exposure to smoke, dust and irritating gases. Another effective measure is the use of soothing lozenges (slippery elm lozenges or licorice gum drops). If this does not suffice, one may have to take recourse to codeine (prescriptions 3 and 4).

PRESCRIPTION 3.—*Codeine*

	Gm. or Cc.
Codeine phosphate	0.25
Distilled water	4.00
Aromatic syrup of eriodictyon to make	120.00

Mix and label: Teaspoonful in a little water every two hours as required.

PRESCRIPTION 4.—*Codeine in Sugarless Vehicle* *

	Gm. or Cc.
Codeine phosphate	0.25
Saccharin	0.015
Glycerin	2.00
Peppermint water to make	60.00

Mix and label: Teaspoonful in water every two to four hours as required (for associated diabetes).

* Elixir of terpin hydrate and creosote (without sugar) is also satisfactory.

Other effective measures include hot water or milk, throat sprays (Dobell's solution) or inhalants.

PRESCRIPTION 5.—*Creosote Inhalant*

	Gm. or Cc.
Menthol	0.50
Creosote,	
Chloroform, each in sufficient quantity to make	30.00

Mix and label: Inhale by putting a few drops on a "chloroform mask."

PRESCRIPTION 6.—*Steam Inhalant*

Tincture of benzoin	60 cc.

Label: Teaspoonful in one-half pint of hot steaming water and inhale every three hours.

Sedative cough mixtures are often necessary but, as a rule, heavy doses of opiates are to be avoided. Morphine and pantopon are seldom necessary in treating a tuberculous cough unless the disease is associated with cancer, in which event these drugs are of little value.

For treating a cough in diabetes, prescription 4 is effective and safe.

Dyspnea.—In ordinary, uncomplicated tuberculosis, dyspnea is rarely severe enough to necessitate special treatment. When severe, it is usually caused by such sequelae to pulmonary tuberculosis as a degenerated myocardium. Myocardial failure is evident in the cardinal syndrome of cyanosis, dyspnea, pulmonary congestion, especially posterior and basal, aggravated cough and peripheral venous dilatation.

PRESCRIPTION 7.—*Digitalis*

Digitalis	2 Gm.

Divide into twenty capsules.
Label: One every four hours.

4. Fantus, Bernard, in collaboration with Tice, Frederick: The Therapy of Hemoptysis, J. A. M. A. 110:579 (Feb. 19) 1938.

For peripheral vascular failure, accompanied by low blood pressure, pallor, irregular and feeble pulse, poor heart sounds, extreme weakness and sweating, digitalis (prescription 7) may be of help.

Inhalations of oxygen through a nasal catheter or the oxygen tent may be indicated.

In the presence of dyspnea due to marked peribronchial or pleural fibrosis associated with bronchitis, bronchiectasis or compensatory emphysema, there is little to be done medically except to meet the indications as well as can be by fresh air or inhalations of oxygen.

For asthmatic dyspnea or an associated asthma, I use prescription 8. Great care must be taken in the use

PRESCRIPTION 8.—*Antispasmodic Expectorant*

	Gm. or Cc.
Potassium iodide	8
Ammonium chloride	10
Fluidextract of lobelia,	
Fluidextract of belladonna, of each	2
Tincture of hyoscyamus	16
Syrup of glycyrrhiza....in sufficient quantity to make	120

of potassium iodide in tuberculosis, since the drug holds possibilities of harm.

If the antispasmodic expectorant given does not succeed, solution of epinephrine (from 0.5 to 1 cc.) should be given intramuscularly. Ephedrine with phenobarbital (prescription 9) should be given at the same time to prolong the effect.

PRESCRIPTION 9.—*Ephedrine with Phenobarbital*

	Gm.
Ephedrine sulfate	0.75
Phenobarbital	1.50

Mix and divide into fifteen capsules.
Label: One every two hours as required.
Epinephrine .....1: 1,000 ampule as required.

Pain.—Pain, a manifestation of reflex action, is usually situated about the upper part of the chest and shoulder girdle, and rarely needs specific attention but may sometimes be relieved by a mustard plaster applied for fifteen minutes. When severe, lancinating and due to a dry pleurisy, aminopyrine (0.3 Gm. tablets) every two to four hours may give relief. If not, the combination analgesic presented in prescription 10 will usually succeed.

PRESCRIPTION 10.—*Compound Analgesic Capsules*

	Gm.
Codeine phosphate	0.25
Caffeine citrate	0.50
Acetylsalicylic acid	3.00
Acetophenetidin	3.00

Mix and divide into fifteen capsules.
Label: One every four hours as required.

Fever.—Fever is due to the absorption of the bacillary metabolic toxins or to an associated infection with other organisms. As a rule the indication is met adequately by nonmedicinal measures, including absolute rest, collapse therapy, baths and sponges, and plenty of carbohydrates in the form of fruit juices. Antipyretic drugs are contraindicated in the advanced, critical, terminal case. Occasionally, when the fever is high, owing to associated causes or in the early stages of the disease, they may be indicated.

PRESCRIPTION 11.—*Antipyretic*

	Gm.
Acetylsalicylic acid	10
Calcium gluconate	15

Divide into ten powders.
Label: One every four hours as required.

Citrated caffeine, 0.03 Gm. or more, may be added to prescription 11 if the patient seems in need of stimulation.

Night Sweats.—Night sweats are a reaction due to the dropping of the body temperature in the early morning hours. Drugs are of little value and the symptom is best controlled by nonmedicinal measures.

Insomnia.—This is often caused by pain, cough, night sweats and dyspnea. The treatment of the symptom is the treatment of the cause. When due to nervousness, insomnia may be controlled by nonmedicinal measures such as plenty of fresh air, sponging, light massage and a cup of hot milk or chocolate with a few cookies before bedtime. In the severer cases bromide (prescription 12) may suffice. If it does not, the addition of phenobarbital to bromide (prescription 13) may suffice. If this fails, tablets of phenobarbital (0.10 Gm.) may have to be resorted to.

PRESCRIPTION 12.—*Bromide*

	Gm. or Cc.
Potassium bromide	30
Distilled water	30
Syrup of glycyrrhiza.....sufficient to make	120

Mix and label: Teaspoonful in milk at bedtime or after supper and at bedtime.

PRESCRIPTION 13.—*Bromide and Phenobarbital*

	Gm. or Cc.
Potassium bromide	10
Elixir of phenobarbital.....to make	60

Mix and label: Teaspoonful in water at bedtime, repeated every two hours as required.

Improving Nutrition.—It must be pointed out, however, that anything which improves general nutrition helps to increase the defense reaction, and that anything which favors rest favors healing. To the extent to which medicines can be used to improve nutrition they are second only in importance to diet; to the extent to which they favor repose, both physical and mental, they may be used to reinforce the great curative principle of rest. Among drugs that may improve nutrition when they are properly used may be mentioned cod liver oil, iron and arsenic, the bitter stomachics and possibly iodine. The value of cod liver oil ranks high not only because of its vitamins but also because of its high fat content. It may be prescribed in the form of its official emulsion (prescription 14) or as the aromatic cod liver oil (prescription 15).

PRESCRIPTION 14.—*Cod Liver Oil, 50 Per Cent*

Emulsion of cod liver oil	250 cc.

Label: Teaspoonful to a tablespoonful in a little water two hours after meals.

PRESCRIPTION 15.—*Cod Liver Oil*

	Gm. or Cc.
Saccharin	0.25
Compound spirit of orange	10.00
Cod liver oil.....to make	500.00

Mixed and label: Teaspoonful to a tablespoonful two hours after meals.

A patient who takes and digests well an abundance of eggs, cream and butter may not need cod liver oil; his anemia, however, may be benefited by iron (prescription 16) or by iron combined with arsenic (prescription 17). As was the case with creosote, it must be remembered that the iron preparations have a tendency to disturb the digestion.

PRESCRIPTION 16.—*Iron*

	Gm. or Cc.
Iron and ammonium citrate	10
Distilled water	10
Syrup of cinnamon.....to make	120

Mix and label: Teaspoonful to tablespoonful in water three times a day after meals.

PRESCRIPTION 17.—*Iron and Arsenic*

	Gm.
Arsenic trioxide	0.06
Reduced iron	10.00

Mix and divide into thirty capsules.
Label: One three times a day after meals.

In stimulating the lagging appetite a bitter stomachic (prescription 18) is relished by some.

PRESCRIPTION 18.—*Bitter Stomachic*

	Cc.
Tincture of nux vomica	15
Compound tincture of cardamom	15
Compound tincture of gentian q. s. to make	60

Mix.

Tuberculosis is not readily accessible to medicinal measures. The chief stumbling block lies in the fact that it is difficult or impossible to get to the pathologic condition. Thrombosis of the blood vessels, shutting off the circulation to the tubercle, forms a barrier against drugs, a barrier further reinforced by the natural defenses to foreign body intrusion, as represented by the goblet and ciliated cells of the mucous membrane of the respiratory tract and the smooth muscle fibers of the bronchi. The chief hope for a specific treatment in the future lies in research which should extend along lines of study directed toward the development of a drug that will stimulate the body's defense reactions.

3335 West Twenty-Sixth Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

AMSCO OSCILLOMETER ACCEPTABLE

Manufacturer: American Medical Specialties Company, 131 East Twenty-Third Street, New York.

The Amsco Oscillometer, like other oscillometers, is devised primarily to provide a visual method for determining oscillometric indexes and blood pressure by measurement of the pulsations transmitted from a compressed artery to a manometer; the instrument may also be used as a simple anaeroid manometer to record blood pressures found by auscultation of arterial sounds. The firm recommends it for diagnosis of vasomotor disturbances, thrombo-angiitis obliterans, surgical shock, gangrenous conditions, Buerger's disease and the depth of anesthesia.

The instrument may be described as a double bladder arm cuff attached by two rubber tubes to a small, flat metal case having two chambers and dials, two levers and a rubber bulb. The lower dial records blood pressure and the upper one oscillations of the needle caused by blood vessel pulsations. The levers direct the pressure into one chamber or the other and regulate the air valve and the adjustments for finding various pressures. The device is built on the double anaeroid principle in a sealed chamber. It is made in Germany. The firm states, however, that in case of faulty performance it will be replaced or repaired by the dealer in this country.

The pamphlet of operating instructions furnished with the unit describes the changes in the excursion of the upper needle, which should indicate the various pressures and the oscillometric index. After pumping up the pressure in the inflation system and slowly releasing it as directed, a point is reached where the upper oscillometric needle starts to oscillate. At first the oscillations are weak, but at the moment of sudden increase in the excursion of the needle the maximal or systolic pressure is indicated and read from the lower dial. As the pressure is lowered, a sudden shortening of the oscillations should denote the minimum or diastolic pressure. This should be checked by the method of auscultation. Mean pressure is described as the point where the upper needle has its widest excursion after taking systolic pressure, just before the sudden shortening of the excursion in diastolic pressure. In taking the oscillometric readings, for which the instrument is primarily intended, the difference between the minimum and maximum excursion of the upper needle, which is the oscillometric index, is determined at any point.

For diagnosis of the condition of local arteries the firm suggests that it is unnecessary to use the double inflation cuff furnished with the unit; single cuffs in correct sizes are available for the purpose. For oscillometric readings on thigh or leg a special cuff, size 4 by 16 inches, is available; another one, 3 by 12 inches, is made for use on the arms, feet and ankles. The cuffs are applied similarly to the usual blood pressure cuffs and held in place by two slides and buckles.

The instrument was investigated by the Council. The use and accuracy of the Amsco Oscillometer in determining (1) systolic and diastolic arterial blood pressure by visual changes in the oscillations coinciding with these phases, (2) systolic and diastolic pressures in a manner similar to the use of the anaeroid sphygmomanometer with auscultation of the arterial sounds and (3) the oscillometric index of the lower extremities was studied. The values so obtained in 1 and 2 were compared with those from a mercury manometer by auscultation of the sounds, and the oscillometric index was compared to the readings determined by a control oscillometer.

The readings were obtained as closely together as possible to avoid natural fluctuations in these values and the same extremities were used in each case, the left arm for the determination of the arterial blood pressure and the left leg for the oscillometric index. The group studied consisted of ten patients presenting various manifestations of cardiac or peripheral vascular diseases and a control group of eight healthy young adults.

When determining the arterial pressure by auscultation, the systolic pressure was recorded at the first appearance of the sound and the diastolic at the point where the sounds showed their greatest change to a less intense noise. The oscillometric index was recorded as the maximal fluctuation over the arterial pressure at which it was observed. All the results are charted in the accompanying table.

From the results the following facts seem evident: The oscillometric indexes obtained from the Amsco Oscillometer bear a very close relationship to readings obtained with the control instrument as well as to the clinical condition presenting itself. The slight variations between the two sets of readings are unimportant and may be partially due to subjective sources of error. The visual systolic blood pressure readings agree very closely with those observed on a mercury manometer. The latter values are also about the same as those obtained when the Amsco Oscillometer was used as a simple anaeroid manometer with auscultation. However, the diastolic readings show a variation in many instances of from 10 to 15 mm. of mercury from values obtained by auscultatory methods and it was often nearly impossible to determine the visual change in oscillation that would denote the true diastolic pressure.

The instrument was found very compact, sturdy and relatively easy to use when determining oscillometric indexes. Visual arterial blood pressure determinations require somewhat more time than the auscultatory method and in general seem more likely to be liable to subjective sources of error, particularly the diastolic values.

Results of Tests

		Oscillometric Index		Arterial Blood Pressure, Systolic/Diastolic		
				Amsco Oscillometer		
Case	Diagnosis	Amsco	Control Instrument	Visual	Auscultatory	Mercury Manometer
1	Arteriosclerosis	0.5/ 80	0.5/ 80	170/80	165/ 90	170/ 80
2	Hemiplegia	4/125	5/140	155/70	150/ 92	150/ 80
3	Buerger's disease	0.5/140	0.5/170	185/85	180/100	165/ 80
4	Buerger's disease	0/0	0/0			
5	Mediastinal tumor	8/120	8/120	120/65	125/ 75	124/ 75
6	Coronary disease	2.5/105	2.0/ 95	105/70	105/ 80	105/ 78
7	Carcinoma	5.5/100	5/100	98/75 ?	102/ 72	100/ 65
8	Congestive failure	5.5/140	4.5/170	140/ ?	170/100	160/100
9	Hypertension	4/130	4/130	150/85	155/ 88	150/ 80
10	Pernicious anemia	2/110	3/140	130/85 ?	130/ 80	145/ 90
11	Control	5/ 125	4/110	130/80	120/ 80	120/ 72
12	Control	5/110	6/120	105/ ?	108/ 70	105/ 65
13	Control	6/110	6/110	115/65 ?	112/ 70	115/ 75
14	Control	7/100	7/110	130/70-80	140/ 90	130/ 72
15	Control	3/ 90	4/ 90	105/70	100/ 65	108/ 70
16	Control	6/100	6/100	120/ ?	118/ 80	118/ 80
17	Control	6/100	5/ 90	110/ ?	120/ 80	120/ 75
18	Control	5/100	6/110	115/70 ?	110/ 80	110/ 75

* Question mark indicates that end point is not clear.

In the opinion of the Council the Amsco Oscillometer is a sturdy, handy instrument the chief value of which lies in the determination of (1) oscillometric indexes, (2) the systolic and diastolic arterial blood pressures when used as a simple anaeroid manometer with auscultation of the sounds and (3) the systolic pressure by the visual technic.

In the light of the foregoing report, the Council on Physical Therapy voted to accept the Amsco Oscillometer for the determination of (1) oscillometric indexes, (2) the systolic and diastolic arterial blood pressures when the instrument is used as a simple anaeroid manometer with the auscultation of the sounds from the arteries and (3) the systolic pressure by the visual technic alone.

COOLEY COMPRESS ACCEPTABLE

Manufacturer: Hewitt Electric and Manufacturing Company, Somerville, Mass.

Distributor: R. K. Osborne, Rochester, N. Y.

The Cooley Compress is a heating pad intended to be used in applying hot wet compresses over limited areas of the body. A complete unit consists of electric heating pads of rubberized cloth (two 11 by 11 inches and one 7 by 7 inches), a control box to regulate current from any source of alternating or direct current to the wire coils in the pads, cloth compresses with thermometer sleeves (six 7 by 7 inches and twelve 11 by 11 inches) and special thermometers to be inserted between the pads (two of 12 inches and one of 6 inches).

Two pads may be attached to the control box at one time, and two switches are provided to regulate heat from "low" to "high." Snaps are attached to the compresses and pads so that they may be fastened together, and eyelets are provided in the pads through which cloth tape may be passed to hold the pads around various parts of the body.

Cooley Compress.

In tests of physical performance made under the auspices of the Council, it was found that each heating unit consumed 15 watts and that two units attached together raised the temperature between the wet compresses at the hottest point to 125 F. The control box operated satisfactorily.

The unit was submitted to a qualified physician, who reports that he tested it clinically in certain dermatologic and normal control cases. His observations were as follows:

Method: Three applications were made over the abdomen, three over the thigh and four over the arm. The flannel compresses were moistened in boric acid solution before application.

Thermometers were placed:

1. In the sleeve provided in the flannel compress.

2. Next to the skin under the compress with the bulb directly under the center of the involute coil.

3. Next to the skin, but about 2 inches from the center of the coil.

The temperature of the thermometer in the sleeve was kept as nearly as possible at 115 F.

Results: The temperature must be watched carefully, as it responds slowly to the rheostat adjustment.

The temperature of the thermometer next to the skin and under the coil ranged from 2 to 5 degrees F. below that of the thermometer in the compress.

The temperature of the thermometer next to the skin and 2 inches from the center of the coil ranged 15 degrees F. below that of the temperature in the compress; however, no "hot spots" were found in the periphery.

It was concluded that the pad might be used as a means of warming wet dressings. The heat can be regulated by means of the thermometer, since the bulb rests at the hottest point of the pad when inserted in the sleeve.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Cooley Compress for inclusion in the Council's list of accepted devices.

BURDICK ULTRIPLEX UNIT SWD-70 ACCEPTABLE

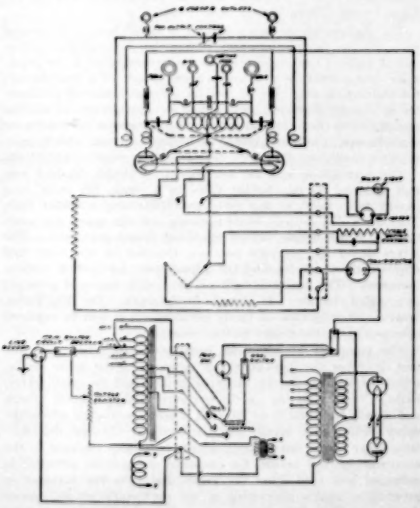
Manufacturer: The Burdick Corporation, Milton, Wis.

The Burdick Ultriplex Short Wave and Ultra-Short Wave Diathermy Unit SWD-70 is recommended for medical and surgical use in the office or hospital. It is similar to the Council-accepted Triplex Short Wave Unit SWD-10 (THE JOURNAL, Dec. 12, 1936) except for the substitution of a shielded ultrashort wave 6 meter circuit in place of the 15 meter short wave circuit, and an 80 meter instead of a 70 meter long wave circuit, together with the necessary rearrangement of switches and wiring.

Burdick Ultriplex Unit SWD-70.

Two vacuum tubes and two rectifier tubes in a tuned-plate, tuned-grid, push-pull oscillator circuit generate high frequency energy at three different wavelengths. These include the 6 meter circuit for air-spaced electrodes, pads and cuffs, the 25 meter circuit for inductance cable and the 80 meter circuit for electrosurgery and conventional diathermy. There are five controls, one voltage control, one output control for the 6 meter circuit, one output control for the cable and surgery circuit, one dissection control for the surgery circuit and one filament voltage control. There are two meters, a voltmeter to register filament voltage and a milliammeter to indicate resonance.

Accessories include six air-spaced electrodes of varying shape and size, two 6 by 8 inch pad electrodes and one 12 foot inductance cable with spacers. The shipping weight of the cabinet is 340 pounds, the height 41 inches, the depth 19 inches and the width 24 inches. The arms are adjustable, with adjustable spacing guards for air-spaced electrodes.



Schematic diagram of circuit.

Regarding physical performance, the firm states that, when using three 200 watt lamps as a load, the maximum output at 6 meters is 500 watts, as measured by the photocell wattmeter method. Using two 200 watt lamps as a load, the maximum output on the 25 meter cable is said to be 475 watts, also measured by the photocell wattmeter method. There was no

calorimeter test. Under normal full load operation, using a lamp load of three 200 watt lamps, the input is recorded as 1,120 watts. After a two hour run at full load, the temperatures inside the transformer coils are stated as: plate transformer secondary, 76.5 C.; filament transformer primary, 57.5 C. The Council confirmed these measursements.

Average Temperatures (F.) of Six Observations

Technic	Deep Muscle		Oral	
	Initial	Final	Initial	Final
Cuff	99.3	107.9	98.2	98.6
Air-spaced electrode	99.9	107.6	98.5	99.1
Cable	99.6	106.6	98.8	99.6

The firm provided tests from a creditable laboratory concerning the capacity of the unit to produce heat deep in human tissues. In the cuff technic, double cuffs of 23½ by 2½ inches with 1¼ inch felt spacing were used. Current was applied up to the patient's skin tolerance to heat. In the air-spaced electrode technic, the air space averaged 2 inches and the centers of the electrodes were 10 inches apart. When the coil technic was used (25 meter circuit) the cable was given four turns and was wound round the thigh with six layers of bath towels for spacing, with each coil approximately 2 inches from its neighbor. Each application was given for twenty minutes.

The unit was operated clinically for the Council over a period of several months and found to render satisfactory service.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Burdick Ultriplex Unit SWD-70 for inclusion in its list of accepted devices.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED.

FRANKLIN C. BING, Secretary.

(1) NUTRADIET BRAND DELPHIA FIGS (WATER-PACKED)
(2) NUTRADIET BRAND GRAPEFRUIT (JUICE-PACKED)
(3) NUTRADIET BRAND PRUNES (WATER-PACKED)
(4) NUTRADIET BRAND SPINACH (WATER-PACKED)

Manufacturer.—The Nutradiet Company, a subsidiary of S & W Fine Foods, Inc., San Francisco.

Description.—(1) Canned Kadota figs packed in water without added sugar, for use in carbohydrate-restricted diets.

(2) Canned Florida grapefruit segments packed in juice, without added sugar, for use in carbohydrate restricted diets.

(3) Canned stewed prunes packed in water without added sugar, for use in carbohydrate restricted diets.

(4) Canned spinach, packed in water without added salt, for use in salt restricted diets.

Manufacture.—(1) Tree-ripened California Kadota figs are graded, inspected, washed in hot water and filled into cans. Water is added. The cans are heated, automatically sealed and heat processed. Insecticide spray is used on the trees before the fruit appears.

(2) Tree-ripened grapefruit is scrubbed and washed under water sprays to remove any spray residue (the spray was applied when the fruit was very small), hand peeled and separated into segments, which are seeded and counted into cans. The cans are filled with grapefruit juice, sealed under vacuum, heat processed and cooled immediately.

(3) Sun-dried California prunes are washed, precooked in boiling water and steam, shaken over a screen to remove foreign matter, inspected and filled into cans. Water is added. The cans are preheated, sealed, heat processed and cooled.

(4) Fresh spinach is trimmed, cleaned, spray washed, blanched and filled into cans. Water is added and the containers are preheated, sealed and heat processed for the length of time and at the temperature prescribed and supervised by the State Department of Health of California.

Analyses (submitted by manufacturer).—

	(1)	(2)	(3)	(4)
Moisture	87.4	89.8	61.6	92.0
Total solids	12.6	10.2	38.4	8.0
Ash	0.3	0.3	1.1	0.7
Fat (ether extract)	0.2	0.1	0.1	0.5
Protein (N × 6.25)	0.5	0.6	1.3	2.7
Crude fiber	0.7	0.1	0.7	0.8
Carbohydrates other than crude fiber (by difference)	10.8	9.0	35.2	3.3
Titratable acidity as citric acid	....	0.1		
Titratable acidity as malic acid	0.1			

Calories.—(1) 0.47 per gram; 13 per ounce.
(2) 0.39 per gram; 11 per ounce.
(3) 1.47 per gram; 42 per ounce.
(4) 0.29 per gram; 8 per ounce.

GERBER'S STRAINED LIVER SOUP WITH VEGETABLES, BARLEY, WHEAT GERM

Manufacturer.—Gerber Products Company, Fremont, Mich.

Description.—Canned strained soup mixture, containing beef liver, carrots, potatoes, lima beans, tomatoes, celery, onions, barley flour, wheat germ and salt.

Manufacture.—The vegetables are prepared and the product is packed essentially as described for Gerber's Strained Vegetable Soup (THE JOURNAL, July 22, 1933, p. 282). The beef liver is U. S. inspected and passed by the Department of Agriculture, and the product is packed under U. S. inspection.

Analysis (submitted by manufacturer).—Moisture 86.9%, total solids 13.1%, ash 0.8%, fat (ether extract) 0.4%, protein (N × 6.25) 4.0%, crude fiber 0.3%, carbohydrates other than crude fiber (by difference) 7.7%, calcium (Ca) 0.0137%, phosphorus (P) 0.0074%, iron (Fe) 0.0028%.

Calories.—0.5 per gram; 14.2 per ounce.

Vitamins.—Vitamin A, 52.8 international units per gram, 1,500 per ounce; vitamin B_1 (thiamin), 0.22 international unit per gram, 6.3 per ounce; vitamin C (ascorbic acid), 0.02 mg. per gram, 0.7 per ounce (equivalent to 0.4 international unit per gram, 14 per ounce).

SIMS MALT-O-WHEAT

Manufacturer.—Sims, Division of Siems Bros., Inc., St. Paul.

Description.—Packaged, coarsely granular breakfast cereal; prepared from whole durum wheat with coarse bran and some fine flour removed. Toasted barley malt is added for flavor and the product is exposed to ultraviolet rays to destroy insect infestation.

Manufacture.—Durum wheat is cleaned by the usual milling methods, coarsely ground and bolted to remove fine flour and coarse bran; material of the desired granulation is mixed in definite proportions with toasted ground malted barley. The mixture is heated for a short period to destroy any insect infestation, passed under ultraviolet ray lamps for a similar purpose and automatically packed in cartons.

Analysis (submitted by manufacturer).—Moisture 11.7%, total solids 88.3%, ash 1.2%, fat (ether extract) 2.5%, protein (N × 6.25) 17.1%, crude fiber 1.6%, carbohydrates other than crude fiber (by difference) 65.9%.

Calories.—3.6 per gram; 102 per ounce.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, SEPTEMBER 16, 1939

CHICAGO MEDICAL SOCIETY INSURANCE PLAN

The Chicago Medical Society has adopted a complete and unrestricted insurance plan for hospital and sanatorium care for its members. After two years of study, conducted by an employment insurance analyst, the society concluded that only cash indemnity plans should be considered.

The plan provides for private room service on a cash indemnity basis, allowing $6 a day for either hospital or sanatorium confinement for a period of ninety-one days for each claim, plus an additional payment, up to $30, for incidental expenses in connection therewith, such as operating room, anesthesia, laboratory, x-ray and ambulance charges. The number of claims in any one year for members under the age of 60 is not limited. Members of 60 years or older are provided ninety-one days at $6 a day plus $30 for incidental expenses in any one year. This is an unusual provision, since most plans limit the number of days of hospitalization in any one year to all members of the group. There are no restrictions as to diseases for which provision is made nor is there any physical examination required for the members of the original group. Later such an examination will be required. Any reputable hospital or sanatorium anywhere may be selected, and the insurance continues to the age of 70 for an annual premium of $10. The plan is underwritten by an established life insurance company.

A supplemental plan, which will provide hospital and sanatorium benefits for the wives and children of the members of the Chicago Medical Society plan, is in preparation. Thus another of the leading medical organizations places its approval on the principle of insurance against the costs of illness, but at the same time affirms its conviction that voluntary action and cash indemnity are vital in plans that conform to the democratic concept.

DENTAL CARIES AND DOMESTIC WATER SUPPLIES

The occurrence of mottled dental enamel in persons who live in certain sections of the United States has been associated with the presence of fluorides in the supplies of drinking water. This observation, together with the knowledge that the ingestion of a few grams of sodium fluoride has proved fatal to human beings, would seem to show that the presence of appreciable amounts of fluorides in drinking water does not serve a useful purpose and is undesirable. As early as 1916, reports indicated that the teeth of children living in an area where mottled enamel was common compared favorably with those of children in other communities where endemic mottled enamel was unknown. More recently a report by Dean [1] covering a survey of a number of states points out that there was an inverse relationship between endemic dental fluorosis and dental caries, the severity of dental caries in general being lower in areas where mottled enamel occurs than in normal areas in the same states. Investigators in other countries have also noted that there is a lessened prevalence of dental caries among persons with mottled enamel or those who live in regions where endemic fluorosis exists.

Dean and his co-workers [2] have now carried out a new well planned investigation. It is known that factors such as age, sex and color may influence the amount of dental caries in a given group. The investigators attempted to take these factors into account. The study was limited to white children from 12 to 14 years of age in four cities in western Illinois. Although the communities were not greatly distant from one another, the water supplies of two of them differed in type and mineral composition from the domestic water of the others. There was notably a definite difference in the fluoride content. In two of the cities the water contained from 1.7 to 1.8 parts per million of fluorides, whereas the water of the other two communities was almost free of fluorides, containing only 0.2 part per million. The dental caries rate in the cities supplied with water almost free of fluorides was from two to three times greater than the rate observed in the other communities. An even greater difference was noted with respect to interproximal, or smooth surface, caries. When the approximal surfaces of the four superior incisors were chosen as a basis of measurement, it was found that there was sixteen times more interproximal caries in the groups studied in the cities where the water was extremely low in fluorides.

It seems reasonable to associate the lower rate of dental caries in two of the cities with the higher fluoride content of their communal water supplies; nevertheless the possibility is not excluded that the composition of the water in other respects may be the principal factor.

1. Dean, H. T.: Pub. Health Rep. **53**:1443 (Aug. 19) 1938.
2. Dean, H. T.; Jay, Philip; Arnold, F. A., Jr.; McClure, F. J., and Elvove, Elias: Pub. Health Rep. **54**:862 (May 26) 1939.

Consequently it seems highly desirable, as indicated by Dean and his collaborators, that studies of dental caries should be accompanied by complete chemical analyses of domestic waters including a search for comparatively rare elements. If this is done, any factor that is possibly being overlooked at present may be brought to light. In any case, considering the apparent similarity of the population groups studied by Dean and his co-workers and the results obtained, it would seem proper from an epidemiologic point of view to ascribe these differences to the composition of the water supplies. If this correlation proves correct, the possibility of partially controlling dental caries through the public water supply becomes of more than academic interest.

TWIN PREGNANCY

Single ovum twinning appears to be mainly a chance phenomenon. Double ovum twinning apparently is influenced by heredity, age and parity. In the first forty years of the obstetric department of Johns Hopkins Hospital, 521 cases of twinning occurred in the combined hospital and home delivery services, or about one set of twins in every eighty pregnancies, counting both viable pregnancies and the abortions. This ratio nearly agrees with that of the whole birth registration area of the United States. In a comprehensive study of this experience, Guttmacher [1] has published two papers and anticipates several others. Two methods are commonly employed to differentiate single from double ovum twins: first, the study of the twins themselves; second, the study of the placental relations. The diagnosis by the first method is best made when the twins are between 2 and 4 years of age. Numerous physical criteria must be satisfied. To diagnose a pair of twins derived from one egg, the two members of the pair must be of the same sex. Although their features, including ears and teeth, must be alike, this resemblance need not be absolute. Each member of the pair may be thought to represent but one half of a single zygote and therefore the twins need not resemble each other more closely than the two lateral halves of one individual. Their hair must be identical in color, texture, natural curl and distribution. They must have eyes of the same color and shade and have the same skin texture and color. They must have hands and feet of the same conformation and approximately the same size. Certain anthropometric values, cephalic index, forearm to upper arm length, and so on must show close agreement in the two members of the pair. They must have similar finger and sole prints.

In the second method of differentiation of single from double ovum twins, that of placental relations, it is assumed that if the embryos arise from two eggs they have separate placentas or a fused single placenta with a four layer partition wall, the amnion and chorion of twin A in contact with the chorion and amnion of twin B. This can be determined by peeling apart the four separate layers. If the twins are derived from one egg, only two layers of amnion form the partition wall.

In the Johns Hopkins series of twins, and on the basis of placental relations, 25.7 per cent were derived from one egg. This figure is almost the same as Greulich's [2] 25.4 per cent, which was obtained by the other method of differentiation, the physical comparison of the twins themselves.

The most common age group for single ovum twinning in the Johns Hopkins series was between 20 and 25 years. Single ovum twinning occurred to the women of various parity with the same frequency that would be expected were it just a chance phenomenon; double ovum twinning, however, was infrequent in primiparas and secundiparas.

The antepartum diagnosis of twins frequently is difficult, having been missed in almost one third of a series of Johns Hopkins cases observed in a twelve year period. When both infants weighed less than 2,500 Gm., one half of the twin pregnancies remained undiagnosed, and when the larger twin weighed 2,500 Gm. or more, the correct antepartum diagnosis was made in about 70 per cent.

A difference in weight existed in the twins at birth of primiparas and multiparas. Among 127 primiparas, 36.2 per cent had twins of term weight; among 440 multiparas, 52.7 per cent had term fetuses. Considering any twin pregnancy a term pregnancy if either of the two infants weighs 2,500 Gm., 49 per cent of the series of twin pregnancies were delivered at term, 38.7 per cent were delivered prematurely and 12.3 per cent were aborted.

The twin pregnancies usually were more than two and a half weeks shorter than ordinary single pregnancies, the ratio having been 257.8 days versus 275.7 days, counting from the first day of the last menstrual period. The Negro women in this series of twin pregnancies had a shorter pregnancy by three and a half days than did the white women.

In smaller groups of twin pregnancies in which the hemoglobin was taken before iron therapy was given, the hemoglobin was below 70 in 40 per cent, while among the single pregnancies it was below 70 in only 11 per cent. Hypertensive toxemia was two and a half times as frequent in the twin pregnancies. Eclampsia occurred once in every thirty cases. The gravity of the association of toxemia with twin pregnancy was attested by the fact that 61 per cent of maternal twin deaths were associated with toxemias. Toxemic and functional vomiting were no more common, however, in twin than in single pregnancy.

1. Guttmacher, Alan F.: An Analysis of 521 Cases of Twin Pregnancy: I. Differences in Single and Double Ovum Twinning, Am. J. Obst. & Gynec. **34**: 76 (July) 1937; An Analysis of 573 Cases of Twin Pregnancy: II. The Hazards of Pregnancy Itself, ibid. **38**: 277 (Aug.) 1939.

2. Greulich, W. W.: Heredity in Human Twinning, Am. J. Phys. Anthropol. **19**: 391 (Oct.-Dec.) 1934.

Current Comment

RAPID DIAGNOSIS OF DIPHTHERIA

The contagious nature of diphtheria, as well as the prognostic significance of the time of administration of antitoxin, necessitates strenuous efforts at early diagnosis. A promising development in this direction was reported by Manzulla in 1938, who described a method for the diagnosis of diphtheria by which the diphtheria bacillus could be cultured in three hours and a macroscopic and microscopic diagnosis of the colonies made at the same time. He used a mixture prepared with 15 cc. of meat broth with peptone, 1.5 cc. of defibrinated ox blood and 1.5 cc. of a 2 per cent solution of potassium tellurite. The pharyngeal exudate was collected with a cotton swab and moistened with 2 cc. of the liquid mixture, placed in a test tube and left for three hours at a temperature of from 36 to 38 C. Small characteristic black colonies could be observed in the swab at the end of three hours, and these could be identified microscopically as diphtheria bacilli. A still more rapid method of diagnosis has been devised, consisting of moistening the pseudomembranes with a 2 per cent solution of sodium tellurite. When the throat is examined ten minutes later, the exudate, if diphtheric, has become black or gray. More recently the direct throat method has been investigated by Tomlin.[1] Tomlin applied the test to forty-six patients, forty-four of whom were admitted to the hospital for diphtheria or suspected diphtheria and two for scarlet fever. Of the forty-four cases, twenty-eight were proved to be diphtheria. Obvious darkening was obtained in twenty-seven of these, and in one darkening was suspected after ten minutes and was definite after thirty minutes. No case of diphtheria in this series would have been missed by placing reliance on the tellurite test. Fifteen of the forty-four cases were decided on bacteriologic and clinical grounds not to be diphtheria. Six of these failed to show darkening in the test. Nine of them did, however, and these represent therefore what might be called "false positives." A negative result, Tomlin concludes, is of value in that it supposes with great accuracy that the disease is not diphtheria. Such a high percentage of false positive results occur, however, that no positive diagnosis of diphtheria should be made on a positive result alone. The test, he believes, can in no way take the place of the clinical and bacteriologic methods of diagnosis already in use. Tombleson and Campbell [2] also have applied the direct method to a series of 200 unselected patients with pharyngeal exudate. After some experience with the test they found that some cases of diphtheria require more than one application of the tellurite solution before a positive result can be obtained. They obtained correspondence between this test and a bacteriologic diagnosis in 67.5 per cent and with a clinical diagnosis in 77 per cent. Definite blackening of the membrane occurred in a high proportion (84.3 per cent) of the cases of diphtheria. However, similar blackening occurred in 46.8 per cent of faucial lesions due to other organisms. Further, no blackening at all occurred in a small number of cases of diphtheria even of a severe type. It appears, therefore, that with careful attention to technical details (including the undesirability of keeping a solution more than four weeks old) a negative observation affords presumptive evidence against diphtheria but a positive test does not establish the diagnosis. It is also agreed that the tellurite test cannot replace either clinical or cultural diagnosis. In spite of these shortcomings the test will probably prove extremely useful, especially in relation to epidemics or in cases in which the technical difficulties of isolating patients make it exceptionally important to procure an immediate presumptive diagnosis. Further investigation may indeed succeed in eliminating some of those who now react with a "false positive" test, which would, of course, enormously increase its usefulness.

1. Tomlin, Eric: Potassium Tellurite in the Diagnosis of Diphtheria, Brit. M. J. 1:1273 (June 24) 1939.
2. Tombleson, J. B. L., and Campbell, R. M.: The Immediate Tellurite Test in Diphtheria, Brit. M. J. 1:1275 (June 24) 1939.

U. S. DEPARTMENT OF JUSTICE SEEKS TO AVOID CIRCUIT COURT OF APPEALS IN APPEAL FROM JUSTICE PROCTOR'S DECISION DISMISSING INDICTMENT OF A. M. A. AND OTHERS UNDER SHERMAN ANTITRUST ACT

According to announcements appearing first in the press, the United States Department of Justice has filed in the United States Supreme Court a petition for a review of the decision of Justice Proctor of the United States District Court for the District of Columbia, dismissing the indictment of the American Medical Association and three other medical organizations and certain individual physicians under the Sherman Antitrust Act. The department seeks in this way to avoid a decision by the United States Circuit Court of Appeals for the District of Columbia, to which an appeal would ordinarily lie and to which the department had already appealed. The department seeks to justify this course on the ground that Justice Proctor's decision would ultimately reach the United States Supreme Court for review, no matter how the Circuit Court of Appeals might decide, and that the case would therefore be speeded and the public benefited by ignoring that court. This line of reasoning, if generally accepted, might relieve all United States circuit courts of appeal of a substantial part of their present work. Moreover, if the Supreme Court refuses to entertain jurisdiction, the actual settlement of the case may be retarded. A decision in the present stage of this case by either the Supreme Court of the United States or by the United States Circuit Court of Appeals must necessarily be limited to questions of law and will not determine in any degree the truth or falsity of the charges against the American Medical Association and others, formulated in the recently dismissed indictment.

ORGANIZATION SECTION

A NEW FEATURE IN INDIGENT MEDICAL CARE

ROLLEN W. WATERSON
Executive Secretary, Lake County Medical Society
WHITING, IND.

The history of medical relief for the indigent sick in Lake County, Ind., is a sordid tale of political intrigue, of investigations and indictments and public scandal . . . of all the abuses and inadequacies the profession has learned to expect when politics, now synonymous with government, gets control of the distribution of medical care. This year, however, certain local changes that are not important to this report have made possible the reorganization of the system, and the plan that has replaced it has reduced the cost of medical relief to approximately half last year's average and permits the indigent patient a free choice of physician.

Under the Lake County plan, a referral physician, a member of the Lake County Medical Society and preferably a general practitioner, is appointed to serve each month. He is responsible to the township trustee, who is overseer of the poor, for all medical opinions and decisions necessary to the proper administration of medical relief.

The indigent person in need of medical care applies for the attention of a physician at the office of the trustee. After the trustee has found that the applicant is entitled to medical care at public expense, the patient is given a purchase order on the physician of his choice for one call—an office call if the patient is ambulatory, a house call if he is not. (Except in the rare cases of actual emergency, the plan does not contemplate that any medical care shall be given without prior authorization: a written order from the trustee.) If the attending physician finds that the single office call is sufficient, the case is closed. If, however, further medical care or hospitalization is necessary, the attending physician sends his written diagnosis and recommendations to the trustee, who in turn sends the patient to the referral physician. If the referral physician, after proper examination, agrees with the recommendations of the attending physician, the trustee issues another order, this one in the full amount for the services required according to an accepted reduced fee schedule. If, however, the referral physician disagrees with the attending physician, a second referral physician (who has been appointed for the month following) is called in, and the opinion of any two of the three physicians is accepted as final by the trustee.

Both for hospitalization and for medical care, the trustee may not be charged for more than the amount originally anticipated and written on the purchase order. If further care or extended hospitalization is considered necessary, a new order must be written by the trustee, again subject to the approval of the referral physician.

In practice the referral system, during its first four months of operation, has reduced both the cost of medical care and the cost of hospitalization to half the average for 1938 in the townships that include the industrial cities of Lake County: Gary, Hammond, Whiting, East Chicago and Indiana Harbor. Conditions peculiar to at least two of these cities, and not the fault of the referral system, still leave much to be desired; but, on the whole, the physicians, their indigent patients, the trustees and the taxpayers agree that the plan is the best yet conceived for the administration of medical relief.

A CONSULTATION SERVICE LIMITED TO PATIENTS OF LOW INCOME

REPORT AFTER SEVEN YEARS OF OPERATION

GEORGE BAEHR, M.D.
NEW YORK

In recent discussions concerning the medical care of people with small incomes, little attention has been devoted to the increasing need of general practitioners for the advice and guidance of experienced internists and specialists and for modern laboratory facilities. Because of the patient's inability to meet the additional cost of these specialized services, the general practitioner is confronted with the necessity of struggling on without the required assistance or with only a fraction of the special services which the problem demands. It is under these circumstances that medical care becomes inadequate for a large part of our employed population.

To meet this need, some hospitals have opened the doors of their outpatient clinics to a paying class of patients. These pay clinics are usually part of a public dispensary. The primary principle of sound medical practice, to encourage patients to remain in the hands of their family physicians, is in conflict with the function of the public dispensary which takes over the complete management of the patient. This conflict of purpose is in part responsible for the general unpopularity of the pay clinics and explains in part why they have largely failed to fulfil their purpose as the guide and assistant of the general practitioner. Another reason is that the outpatient clinic of a hospital is manned largely by the younger and less experienced members of the medical staff so that the service rendered to the referring physician is usually not of consulting caliber.

In 1931 the medical staff of the Mount Sinai Hospital, New York, developed a plan designed to place all the experience and the facilities of a large general hospital at the disposal of the practitioners of the community and yet avoid the objectionable features of previous experiments of this nature. A Consultation Service for People of Moderate Means was established in November 1931 by the medical staff with the encouragement and cooperation of the trustees of the hospital. Details of the plan were published in THE JOURNAL.[1] The present report deals with the experience of the service over a period of more than seven years. Although the Consultation Service was established primarily as an experiment, the extent to which the physicians of the community have availed themselves of its facilities no longer leaves any doubt of the need for its continuation.

1. Baehr, George: A Consultation Service for Patients of Moderate Means, J. A. M. A. **98**:2159 (June 11) 1932; ibid. **102**:1305 (April 21) 1934.

During the seven years of operation, 3,527 physicians have referred 12,613 patients to the Consultation Service for diagnostic investigation. The continued growth of the service has been limited only by the fact that the available staff and facilities could no longer be expanded without loss of efficiency. For more than three years the service has functioned continuously at its maximum capacity. Throughout these years there has always been a waiting list of referred patients and many have been turned away.

The cordial relationship between the Consultation Service and the local medical profession has been due to strict adherence to the principles on which it was primarily established. No patients are accepted unless referred by their physician. The work is limited to diagnosis. The clinical investigation is carried out by internists, surgeons and specialists who are the members of the visiting staff of the hospital proper. At its conclusion, the patient is returned to the referring physician with as complete a diagnostic opinion as possible, together with detailed advice concerning appropriate therapy. Although no therapy is practiced, the physician who refers a patient is free to avail himself of the advice and guidance of the staff in carrying out the therapeutic procedures recommended.

Number of Patients Admitted Each Year

1932	996 (Nov. 1931 to Dec. 30, 1932)
1933	956
1934	1,242
1935	1,747
1936	2,226
1937	2,658
1938	2,788
Total	12,613

As the aim of the service is to cooperate with practitioners in the medical care of people of limited means, the economic level of eligibility is a maximum income of $2,400 a year for unmarried persons and $4,000 for total family income. For families of more than five members, an extra allowance of $400 is added for each additional dependent. Physicians are requested to refer only patients who fall within this economic group and the patients must give satisfactory information concerning salaries and total family income before they are accepted.

A flat fee of $35 is charged all patients regardless of the illness or the number of consultations and laboratory examinations that may be required. The advantage of the flat fee is that the patient knows the total cost in advance irrespective of the nature of the condition that may be found and the number or complexity of the diagnostic procedures that may prove necessary; the physicians of the consultation service do not find themselves restricted in the thoroughness and completeness of their diagnostic investigation by the patient's financial limitations.

To avoid interference with the practice of individual consultants, the fee was set at about double the average amount charged patients of this class by a specialist for an individual consultation or major laboratory examination. This has served automatically to exclude most patients with simple conditions which require only the services of a single specialist.

First appointments for new patients are made either for Monday, Wednesday or Friday afternoons, when they are interviewed by the associate director and referred to an internist. On the intervening days of the week they return for special diagnostic procedures, for the specialist consultations and for confirmatory reexaminations of various kinds. The patients average five visits, or about seven to ten days for completion of the study. Unusually difficult or complicated cases require a longer period. Two or three additional days are necessary before all reports are received and

Geographic Distribution of Physicians Who Referred Patients

Greater New York		2,554
Manhattan	1,012	
Brooklyn and Queens	885	
Bronx	627	
Richmond	30	
New York state outside of Greater New York		362
Westchester	100	
Long Island	194	
Other parts of New York state	68	
New Jersey		518
Connecticut		50
Other New England states		7
Pennsylvania		24
Other states		12
Total		3,527

recorded and the case is summarized by the associate director of the service. If there is any doubt about the accuracy of the diagnosis or the completeness of the investigation, the patient is summoned for a reexamination by the director or associate director before the final report is made to the referring physician.

The referring physician actually receives a complete transcript of the entire record, which includes in its final form a correlation and interpretation of all observations by the director or associate director of the service. The director reviews and initials a first draft of every report before it is transcribed into its final form.

All members of the visiting staff of the hospital are available for service; full attending physicians and specialists are called whenever justified by the unusual nature of the case, and they respond as promptly as the junior members of the staff. Because the daily work of the service makes large demands on their time, internists, gynecologists and otolaryngologists are employed during periods when they are not on ward duty in the hospital.

Number of Patients Referred by Individual Physicians

1,473 physicians referred	1 patient
736 physicians referred	2 patients
787 physicians referred	From 3 to 5 patients
346 physicians referred	From 6 to 10 patients
147 physicians referred	From 11 to 25 patients
28 physicians referred	From 25 to 50 patients
5 physicians referred	From 50 to 100 patients
3 physicians referred	More than 100

All other specialists, who are required irregularly, are called when on ward duty, for they are then in the hospital and are more promptly available for consultations.

In about 15 per cent of the cases no significant organic disease can be discovered and the illness must be ascribed to a psychoneurosis. The diagnostic investigation of such patients usually requires an unusually large number of costly clinical and laboratory investigations because of the variety of somatic complaints and the need for convincingly eliminating the possibility of obscure organic disease. At the conclusion of the investigation these patients are always studied by a psychia-

trist. Because of his greater experience and skill he is usually able to elicit important information covering significant environmental and social factors and aberrations in personality or behavior of which the family physicians are unaware. Details of the conclusions and recommendations of the psychiatrist are recorded in a supplementary confidential report to the referring physicians.

Under the original arrangement with the hospital, which has proved to be mutually agreeable, the gross income is shared equally between the participating physicians and the hospital. Half the gross income per month is therefore available for payment of the medical staff. Consultants are credited with half a work unit for one consultation and with a full work unit for two or more consultations during the same afternoon. The internists receive credit for one work unit for seeing three new patients in a period of two hours. The director is credited with four work units a week and the associate director, who is on duty half of every day, is credited with six work units a week.

At the end of each month the value of the unit is determined by dividing the total number of earned units into half the gross income. The funds are then distributed monthly to those who rendered any medical service during the previous month. The value of the unit fluctuates monthly between $13 and $15. Specialist consultants therefore receive from $6.50 to $7.50 for each consultation. An internist who works three afternoons a week receives from $150 to $180 a month. Specialists doing the largest volume of work may earn up to $400 in a month. In order to distribute the income equitably, the service is rotated among most of the members of the visiting staff during the course of the year.

Half the gross income remaining after payment of the medical staff is used by the hospital for the payment of the administrative, technical and secretarial staff of the Consultation Service, for light, heat and building maintenance, for cleaning and laundry services and for the actual cost of all services rendered by the various central laboratory departments. In arriving at estimates of the cost of services of this nature shared with other departments of the hospital, an equitable proportion of administrative and other general expenses is included. Nothing is charged for rent or for interest on a capital investment of about $15,000 which is to be repaid out of future earnings.

As the service is designed for patients of very moderate means, the hospital has agreed to derive no profit from the operation of the Consultation Service either directly or indirectly. During the first three years there was an accumulated net operating deficit of $14,368.59. This deficit in annual payments to the hospital for services rendered at cost was carried as a loan. Since 1935 an annual net operating surplus has permitted us gradually to liquidate this debt in full (1939).

The surplus remaining from that half of the gross income used to reimburse the hospital for all operating expenditures other than payments to clinicians is now being applied toward repayment of the loan of about $15,000 for the original equipment and furnishings. It is planned to use part of any future operating surplus to build up a small reserve fund for equipment replacements and the remainder will be applied to the benefit of the participating clinicians.

The need for a consultation service for people of moderate means is best demonstrated by the number and proportion of practicing physicians in the community who have used it for the investigation of patients with clinically obscure conditions which in their opinion required multiple consultations and laboratory examinations in order to establish a diagnosis.

The 3,527 physicians include 1,012 who practice in Manhattan, 1,542 who practice in the other boroughs of the city and 862 who live within a radius of 50 miles from the center of the city but outside of greater New York, a total of 3,416 metropolitan physicians. Patients were referred by 111 physicians living outside a radius of more than 50 miles from the center of New York city. If we can assume that there are 13,000 actively practicing physicians in the metropolitan area, the 3,416 metropolitan physicians who have patronized the consultation service constitute more than 26 per cent of the physicians in the area.

Financial Statement

	1932	1933	1934	1935	1936	1937	1938
Gross income	$30,242.50	$33,215.50	$41,024.50	$50,623.00	$76,312.50	$90,747.70	$94,891.50
Fees to clinicians	15,236.25	16,300.75	21,329.75	29,287.75	37,480.00	44,866.25	46,558.75
Salaries to employes	6,221.33	6,925.68	8,230.65	8,084.80	9,709.20	11,554.52	12,041.49
Supplies (direct purchases)	851.29	781.13	1,513.11	1,471.97	1,576.45	2,284.32	2,982.62
Operating costs	14,023.96	15,625.31	16,797.79	20,333.75	23,423.46	27,428.92	29,862.77
Net operating loss	5,142.63	5,517.87	2,856.80	.....	.....	.....	.....
Net operating profit	.....	.....	.....	404.73	4,313.39	4,913.49	3,446.47
Accumulated deficit	.....	11,511.79	14,368.59	13,963.86	9,650.47	4,736.98	1,290.51

The increasing interest of practitioners is suggested by the fact that 632 new physicians referred patients for the first time during 1938, the seventh year of operation. Among the 1,473 physicians who have referred only one patient are most of the 632 who used the service for the first time in 1938. Two or more patients were referred by 2,052 physicians, of whom 529 referred more than five.

In the last few years a serious deterrent has been the fact that physicians have been obliged to wait two weeks or longer for an appointment unless the patient's condition was regarded as extremely urgent. Limitation of the maximum number of new appointments to sixty a week was considered necessary in order to maintain a proper standard of careful, thorough work.

Operation of the Consultation Service to the satisfaction of the physicians of the community and of the members of the hospital's medical staff is due in large part to the enthusiasm of those who have administered the service and, above all else, to the efficiency and tact of the nurses, secretaries and volunteer assistants who act as intermediaries between the patients, the referring physicians and the clinicians who participate in the investigations. If the volume of work were permitted to outgrow the physical facilities and the available medical staff, the service would inevitably become routinized and soon lose its personal character; detailed supervision would be more difficult.

The steady growth of the service can be visualized from the financial statement of the years 1932 to 1938. The total annual income of the clinicians is slightly less than half the gross income, owing to the fact that half of each fee to which they are entitled was remitted to physician patients and to the dependents of physicians. Both the gross income and the total annual income to clinicians increased more than three fold between 1932 and 1938.

This ambulatory consulting service represents a substantial expansion of the hospital's activities. The number of obscure diagnostic problems which are studied annually now equals or exceeds the total number of similar problems investigated by the entire medical division of 150 beds during the course of a year. The medical problems presented by the patients of the consultation service are as important as those encountered in the hospital; in fact, they are apt to be more important to the patients because they represent the beginnings of disease, when patients are still in the operable or otherwise curable stage of their illness.

In the light of this experience of seven years, the Consultation Service may be regarded as a successful experiment in placing the professional and physical facilities of a large, well equipped general hospital at the disposal of the practicing physician of the community for the benefit of patients of low income. It has given these people a type of complete service which they could not otherwise have secured and it has enabled them to conserve their slender resources for the subsequent treatment of their disease. It has undoubtedly enabled a large number of physicians to retain private patients whom they might have lost to the public wards and clinics. Through the Consultation Service the hospital is making and maintaining new contacts with hundreds of physicians and is steadily expanding its influence on the practice of medicine outside its walls.

110 East Eightieth Street.

LONGER LIFE FOR AMERICANS

"The health of the American people is getting better all the time, and their average length of life is increasing accordingly," is the conclusion of the Statistical Bulletin of the Metropolitan Life Insurance Company (**20**: 1 [Aug.] 1939):

"Since the turn of the century the average length of life of the white boy baby has increased by twelve and one-half years; in 1937 his expectation of life at birth was 60.75 years, whereas in 1901 it was only 48.23 years. For the white girl baby the gain in average length of life over the same period has been even greater and amounts to fourteen years, the improvement being from an expectation of life at birth of 51.08 years in 1901 to one of 65.08 years in 1937. Our women do better than our men by four years and four months.

"These gains have been accomplished despite the World War, an influenza pandemic which destroyed even more human lives than did the war, and the greatest economic upheaval of generations, with its health-menacing potentialities. . . .

"In 1901 less than nine out of every ten white male babies born alive survived to reach their first birthday. However, by 1937 health conditions had improved to such an extent that at least nine out of every ten newly born will attain age 24. Among white girl babies, too, less than nine out of every ten born in 1901 survived their first year of life; but in 1937 the conditions were such that nine out of every ten babies will reach age 32. According to the situation prevailing in 1901, almost half of the white male babies would have died before attaining age 57, while the half-way mark on the basis of health conditions in 1937 was at 67 years. For white females the corresponding ages were 61 years in 1901 and 72 years in 1937. With half our womenfolk surviving beyond the 70 year mark, we can well understand why our population is rapidly growing older."

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ILLINOIS

Strike for Safe Water at State Hospital.—Several hundred workmen, who went on strike at the state hospital for the insane near Manteno because of the epidemic of typhoid there, returned to work September 6 after they were promised a satisfactory water supply, according to the Chicago *Tribune*. Laborers and skilled workmen, who have been constructing new buildings at the hospital, quit work several days prior to this after a futile demand that contractors be responsible for all expenses if they contracted typhoid while at work, it was stated. The men agreed to resume work when the contractors arranged to haul drinking water from the village of Manteno. The *Tribune* stated that polluted water from artesian wells at the hospital is believed to be responsible for the epidemic which has taken thirteen lives and made hundreds ill.

Chicago

Joint Meeting on Tuberculosis.—Dr. Erik Hedvall, director of the University Tuberculosis Clinic and assistant professor of tuberculous diseases, University of Lund, Sweden, will address a joint meeting of the Institute of Medicine of Chicago and the Chicago Tuberculosis Society at the Palmer House September 22. His subject will be "How Does Pulmonary Tuberculosis Begin in Adults?"

IOWA

Upper Des Moines Society Meeting.—The summer meeting of the Upper Des Moines Medical Society was held at The Inn on Lake Okoboji August 17. Included among the speakers were Drs. Claude F. Dixon, Rochester, Minn., on "Malignancy in the Large Bowel"; Rollin Russell Best, Omaha, "Practical Management of Biliary Tract Diseases," and Samuel E. Sweitzer, Minneapolis, "The More Common Skin Diseases, Their Diagnosis and Treatment." Dr. Felix A. Hennessy, Calmar, president of the state medical society, spoke on medical economics.

Personal.—Dr. Max L. Durfee of the staff of the health service of the University of Michigan, Ann Arbor, has been appointed director of the health service at Iowa State Teachers College, Cedar Falls, it is reported.——Dr. Forrest J. Austin, formerly of Houghton, Mich., has been appointed director of a district health unit for Webster, Calhoun and Boone counties. —— Dr. Ellis K. Vaubel, Indianapolis, has been appointed assistant director of the division of preventable diseases of the state department of health, succeeding Dr. Paul Stephen, who resigned to enter private practice at Manchester.

KENTUCKY

Changes in Health Officers.—Dr. Neale M. Atkins, Greenville, health officer of Muhlenberg County, has been transferred to Graves County to take charge of a new unit with headquarters at Mayfield.——Dr. Don V. Hatton, Leitchfield, has resigned as health officer of Grayson County to take a similar position in Virginia.——Dr. James O. Nall, Clay, has been appointed health officer of Lawrence County, with headquarters at Louisa.

Society News.—Drs. Joseph Garland Sherrill and Archibald M. McKeithen will address the Jefferson County Medical Society, Louisville, September 18 on "Surgery of the Gallbladder and Biliary Passages" and "Preoperative and Postoperative Care in Diseases of the Gallbladder and Common Duct," respectively.——Dr. Chauncey W. Dowden will address the Louisville Medico-Chirurgical Society September 22 on "Differentiation of Myocardial Disease and Gallbladder Disease."

LOUISIANA

Ban on Ethyl Glycerin.—The state board of health issued an order August 25 forbidding the use of ethyl glycerin in flavoring extracts or drugs marketed in Louisiana until the board has had an opportunity to test and approve it. The new chemical compound takes the place of alcohol in flavoring extracts and has been recommended for use in a similar manner for drugs. It is not subject to tax and is therefore cheaper than alcohol, the health department commented.

MARYLAND

Pneumonia Campaign.—The state department of health will begin a fall campaign against pneumonia with an institute for county health officers, public health nurses and laboratory workers in Baltimore September 22. The morning session will be devoted to discussions of pneumonia control and the afternoon to instruction in laboratory procedure. Instruction in the most recent methods of treatment will be given by Drs. Perrin H. Long and Horace L. Hodes. Funds were appropriated by the last session of the legislature for pneumonia control and treatment. The health department will now be able to provide the necessary laboratory aid for physicians and to furnish the drugs for residents of the counties unable to buy them.

MASSACHUSETTS

Fundamentals of Health Education.—A survey course in fundamentals of health education will begin at Boston University School of Education September 25 to continue weekly until January 22. The speakers will include:

Dr. Harold C. Stuart, Boston, Maternal and Infant Care.
Elmer V. McCollum, D.Sc., Baltimore, Nutrition.
Dr. Karl A. Menninger, Topeka, Kan., Family Relationships.
Dr. George H. Ramsey, White Plains, N. Y., Communicable Diseases.
Dr. Shailer U. Lawton, New York City, Mental Hygiene.
Dr. Edmund Jacobson, Chicago, Relaxation.
Dr. Esmond R. Long, Philadelphia, Tuberculosis.
Frederick R. Rogers, Ph.D., Boston, The Measurement of Physical Fitness.
Austin H. MacCormick, commissioner of correction, New York, Governmental Relationships.
Dr. Henry D. Chadwick, Boston, State and Local Public Health Department Educational Functions.
Dr. Walter S. Cornell, Philadelphia, Local School Health Department Organization and Services.
Alexander J. Stoddard, Philadelphia, Functions of School Administrators and Boards of Education in Conserving Community and National Health.
Irving Fisher, LL.D., New Haven, Economics of Health Education.
Frank P. Graves, LL.D., New York, A Tentative Prognosis: The Future of Health Education.

MICHIGAN

Poliomyelitis Declines in Detroit.—Schools will open in Detroit September 18. The recent outbreak of poliomyelitis, newspapers reported, caused the Detroit Board of Education to delay the opening of schools on the advice of the city board of health, although suburban schools and Wayne University were to have opened on schedule. With three new cases of poliomyelitis and one death September 5, the number of active cases in Detroit was given as seventy-seven with fifteen deaths. There were 260 cases reported in August.

MINNESOTA

Fraternal Order Must Give Members Choice of Physician.—Attorney General J. A. A. Burnquist recently ruled that a fraternal order may not legally furnish medical services if it designates and controls the physician in attendance on the patient. The ruling was made at the request of the state board of medical examiners, which reported that one order is furnishing service to 1,200 members and their families through such an arrangement. The fraternal order is jeopardizing its corporate charter in lending itself to this practice, which constitutes practice of medicine by a corporation, the attorney general said. "For a doctor to aid a corporation or a layman to practice medicine unlawfully is a violation of the statute," Burnquist said. "A licensed physician should not aid or abet any one to practice medicine unlawfully, and it follows that if he does so he is guilty of immoral, dishonorable and unprofessional conduct within the meaning of the law." The attorney general pointed out that the right of a fraternal order to furnish sick benefits is not otherwise impaired if it complies with the other laws of the state; it is designation and control of the physician in attendance on the patient that is objectionable.

MISSISSIPPI

New Program on Venereal Diseases.—Dr. Paul T. Erickson, U. S. Public Health Service, arrived in Jackson recently to launch a year's program in the control of venereal diseases in cooperation with the state department of health. He will maintain headquarters in Jackson and work throughout the state. Dr. Erickson recently completed a course on venereal diseases at Johns Hopkins University.

Society News.—Dr. Luther L. McDougal Jr., Paris, Texas, addressed the Northeast Mississippi Thirteen Counties Medical Society in Aberdeen September 12 on "The Feeding of the Normal Child."——Dr. Leon H. Brevard, Deeson, addressed the Coahoma County Medical Society at a meeting with the Clarksdale Hospital medical staff August 9 on amebic dysentery.——At a meeting of the Issaquena-Sharkey-Warren Counties Medical Society August 8 Drs. Alfred J. Messina and Guy P. Sanderson, Vicksburg, spoke on "Some Uses of Sulfapyridine" and "Endometriosis" respectively.——Dr. John H. Musser, New Orleans, discussed pneumonia before a meeting of the Coast Counties Medical Society in Biloxi August 2.

Changes in Health Officers.—Dr. William D. Smith, Senatobia, has been appointed health officer of Tate County, succeeding Dr. John Sidney Eason, Coldwater.——Dr. John E. Tate, Ripley, has been appointed health officer of Tippah County for a two year term.——Dr. Ransom J. Jones, Poplarville, formerly director of the Pearl River County health department, has been named to a similar position in the southeastern district, it is reported. This district, composed of George, Greene, Perry and Stone counties, was organized in March; Dr. John W. Dugger, Jackson, has been acting head.——Dr. Richard B. Austin, Forest, has been named part time health officer in Scott County, filling the unexpired term of Dr. William E. Anderson, who has moved to Dyersburg.

NEW JERSEY

Infantile Paralysis Delays Opening of Schools.—Opening of public and parochial schools in Camden and several suburbs has been delayed until September 18 because of infantile paralysis. Newspapers report that sixty cases have occurred in this area since July 1 with eight deaths.

Laboratory for Study of Viruses.—A new laboratory for the study of filtrable viruses has been established at New Brunswick by the Squibb Biological Laboratories and Raymond C. Parker, Ph.D., a member of the staff of the Rockefeller Institute for Medical Research, has been appointed director, it was announced August 29. A special building has been equipped for the research. Dr. Parker is a native of Nova Scotia and took his dortorate at Yale University, New Haven, Conn., in 1927.

NEW YORK

Epidemic of Sore Throat.—Eighty cases of septic sore throat recently occurred in a boys' camp at Deer Park, Orange County, the state health department reports. Investigation was being continued to determine whether an infected food handler had been the source of infection.

Society News.—Dr. Paul Reznikoff, New York, will address the Medical Society of Westchester County, White Plains, September 19 on "Disorders of the Blood in General Practice."——Dr. Frederick W. Bancroft, New York, addressed the Dutchess County Medical Society September 13 on "Technic of Appendectomy."

Typhoid Carriers Supervised.—The state department of health reported July 31 that 412 typhoid carriers were under supervision at the end of 1938. Forty-five new carriers were added to the list and thirty-one removed. Of the new carriers, twenty-seven were discovered as a result of an investigation of sporadic cases of typhoid, ten through release cultures and the remainder through other circumstances. Of those removed sixteen died, several were released after tests had shown they were no longer carriers and others moved to other health jurisdictions. Two typhoid outbreaks during the year were traced to carriers, *Health News* reports. One was caused by a carrier who supplied raw milk and the other by a carrier who prepared picnic food.

New York City

Hospital Commissioner Proposes Ten New Hospitals.—Dr. Sigismund S. Goldwater, commissioner of hospitals, proposed ten new city hospitals to be erected in the next six years in a budget presented to the city planning commission August 14. The hospitals, which would cost about $56,000,000, would be located as follows:

Brownsville, Brooklyn, general hospital and dispensary, 600 beds.
Harlem-Bronx district, tuberculosis, 500 beds.
Harlem district, Manhattan, general hospital and dispensary, 500 beds.
Queens, general hospital and dispensary, 500 beds.
Bay Ridge, Brooklyn, general hospital and dispensary, 300 beds.
Bronx, general hospital and dispensary, 500 beds.
Coney Island, Brooklyn, general hospital and dispensary, 300 beds.
Welfare Island, Manhattan, cancer hospital, 400 beds.
Manhattan, West Side, new city hospital to replace present City Hospital on Welfare Island.
Brooklyn, near Kings County Hospital, venereal disease hospital, 400 beds.

Examination for Psychiatrist.—The National Committee for Mental Hygiene announces that an examination will be held in the near future for the position of school psychiatrist

for the public schools of New York. Applicants must be between 30 and 45 years old, graduates from approved medical schools and must hold licenses to practice in New York. They must have had twelve semester hours in approved courses in psychiatry and psychology and six semester hours in education. They must also have had five years of practice in psychiatry, including 800 hours of experience in approved institutions for treatment of mental disease and mental defects and 1,200 hours in clinics for personality and behavior disorders of children. Information may be obtained from Joseph K. Van Denburg, Board of Examiners, 500 Park Avenue, New York.

FCC Denies Automobile Paging Service.—The Federal Communications Commission recently denied an application by the Doctors' Telephone Service for a permit to construct a special emergency radio station to page physicians in their automobiles. The commission maintained that the need for such service was not established in the application. It was estimated that about seventy-five occasions would arise each day when the radio paging service would be desirable, but the commission said that the fact that a subscriber was wanted on the telephone did not prove that an emergency existed. The report noted that no representatives of the medical profession appeared in support of the application. Frequencies of the type requested for this service have a limited range of effectiveness, with interference from automobile ignition and other electrical sources at distances beyond 10 miles from the transmitter. For this reason such a station would not render complete service in the New York area.

NORTH CAROLINA

Institute for Hospital Administrators.—The first southern institute for hospital administrators was held at Duke University, Durham, the first two weeks in August with seventy-two hospital officials present from sixteen states. Lectures were presented at morning sessions and the administrators visited hospitals in various towns each afternoon for demonstrations. The sponsoring agencies included the American College of Hospital Administrators, the Southeastern Hospital Conference, the Carolinas-Virginia Hospital Conference, the University of North Carolina and Duke University.

Personal.—The Guilford County Medical Society honored Dr. Merle D. Bonner, superintendent of the Guilford County Tuberculosis Sanatorium, Jamestown, with a silver plaque for outstanding medical work during the year, presented at a dinner meeting August 3. Dr. William de B. MacNider, dean, University of North Carolina School of Medicine, Chapel Hill, was the principal speaker.——Dr. Fletcher R. Adams, Monroe, health officer of Union County, has been appointed health officer of Catawba County, to succeed Dr. Clarence H. White, formerly of Newton and now of Philadelphia.——Dr. Johanna Christine Thelen, Madison, Wis., has been appointed college physician at Greensboro College for Women.

OHIO

Lectures for Practitioners.—A course of free lectures on recent advances in medicine and surgery will be presented at the Cleveland City Hospital on Mondays, Wednesdays and Fridays during October. Western Reserve University School of Medicine is offering the course through the staff of the hospital. Lectures will last an hour and will be followed by a question period of an hour.

Dr. Sabin Goes to Cincinnati.—Dr. Albert B. Sabin of the Rockefeller Institute for Medical Research, New York, has been appointed associate professor of pediatrics at the University of Cincinnati College of Medicine, Cincinnati. He will also hold a research fellowship with the Children's Hospital Research Foundation. Dr. Sabin graduated from New York University College of Medicine in 1931.

Annual Northwestern Ohio Meeting.—The ninety-fifth annual meeting of the Northwestern Ohio Medical Association will be held at Van Wert October 3. The scientific program includes:

Dr. Carl E. Badgley, Ann Arbor, Mich., Fracture of the Femur.
James T. Bradbury, Sc.D., Ann Arbor, Therapeutic Endocrinology; Laboratory Aspects of the Sex Hormone Preparations.
Dr. Harry A. Towsley, Ann Arbor, Contagious Diseases.
Dr. Albert C. Furstenberg, Ann Arbor, Acute Infections of the Mouth, Throat and Neck.
Dr. Walter M. Simpson, Dayton, Undulant Fever.
Dr. Frederick A. Coller, Ann Arbor, Treatment and Closure of Wounds.

Dr. Edward J. McCormick, Toledo, councilor of the fourth district of the Ohio State Medical Association, will deliver an address at a luncheon on "The Socialization Problem Confronting Present Day Medicine." A golf tournament will be held Monday afternoon October 2 at the Willow Bend Country Club.

PENNSYLVANIA

State Medical Meeting at Pittsburgh.—The eighty-ninth annual meeting of the Medical Society of the State of Pennsylvania will be held in Pittsburgh October 2-5. In addition to an opening general meeting Tuesday evening October 3 there will be general scientific sessions Wednesday and Thursday mornings. Guest speakers announced for general and section meetings are:

Dr. Walter L. Winkenwerder, Baltimore, Relationship of Urticaria and Angioneurotic Edema.
Dr. Charles H. Peckham Jr., Baltimore, The Toxemias of Pregnancy.
Dr. Armand J. Quick, Milwaukee, Clinical Significance of Prothrombin as a Factor in Hemorrhage.
Dr. Walter G. Maddock, Ann Arbor, Mich., Research and Its Application to the Water and Salt Balance Problem (in a symposium on salt and water balance and acid-base equilibrium).
Dr. Stuart W. Harrington, Rochester, Minn., Diagnosis and Surgical Treatment of Carcinoma of the Breast with Five, Ten, Fifteen and Twenty Year Results and Factors Which Influence Prognosis.
Dr. Algernon B. Reese, New York, Determination of the Cause and Surgical Treatment of Unilateral Exophthalmos.
Dr. Ferris Smith, Grand Rapids, Mich., Correlation of Chronic Infection of the Upper and Lower Respiratory Tracts.
Dr. Bronson Crothers, Boston, Appraisal of Children After Birth Injury.
Dr. John A. Toomey, Cleveland, Management of Scarlet Fever and Its Complications.
Dr. George C. Andrews, New York, Nutritional Disturbance in Relation to Skin Diseases.
Dr. Reed M. Nesbit, Ann Arbor, The Neurogenic Bladder.
Dr. Joseph L. Baer, Chicago, Treatment of Prolapse of the Uterus.

The program of the general sessions has been arranged around specific subjects, with addresses followed by round table discussions. Subjects for Wednesday morning are syphilis, allergy and maternal welfare; for Thursday morning they are appendicitis, chemotherapy in pneumonia and mental health. The annual golf tournament will be played Monday October 2 at the Edgewood Country Club.

Philadelphia

Society News.—The First Councilor District, which is confined to Philadelphia County, will hold its annual meeting Wednesday afternoon September 20 at the headquarters of the Philadelphia County Medical Society. Drs. David W. Thomas, Lock Haven, president of the Medical Society of the State of Pennsylvania, and Rufus S. Reeves, president of the county society, will make addresses and speakers on the scientific program will be: Drs. Harry L. Bockus, on "Medical Treatment of Peptic Ulcer" and Jacob H. Vastine, "The X-Ray in Peptic Ulcer." Charles E. Kenworthey, an attorney, will speak on "What Is Malpractice?" In the evening the county society will hold its inaugural meeting of the season. Dr. Thomas will speak on "The Value of Medical Organization." Dr. Reeves will be installed as president to succeed Dr. Francis F. Borzell and Dr. Frank H. Lahey, Boston, will address the society on "Surgical Treatment of Peptic Ulcer." In addition to these meetings the woman's auxiliary of the first district will meet in the afternoon with the following speakers, among others: Drs. Stanley P. Reimann, on "Advance Treatment and Control of Cancer"; Elmer Paul Reiff, "Importance of Immunization"; Burgess Lee Gordon, "New Methods of Control of Pneumonia and Tuberculosis" and Leonard F. Bender, "Child Welfare."

TENNESSEE

Personal.—Dr. William C. Sanford, Cleveland, who has been director of the Bradley County health department for nine years, has been appointed health commissioner of Chattanooga. He succeeds Dr. John W. L. Cooper, who resigned to devote full time to private practice.——Dr. Enoch W. Tipton, Kingsport, has been elected mayor of the town.

Changes at State University.—Oren W. Hyman, Ph.D., administrative officer of the University of Tennessee College of Medicine, Memphis, has been appointed dean of administration, it was reported August 1. Dr. Conley H. Sanford, associate professor of medicine, has been made professor and head of the department of medicine to succeed Dr. James B. McElroy, who resigned because of ill health. Dr. McElroy will continue as professor, however, according to the report. Among other changes, Dr. Robert H. Miller, associate professor of anatomy, has been made assistant dean; Dr. Lathan A. Crandall Jr., Chicago, professor of physiology, and Dr. Lucius C. Sanders, Memphis, assistant professor of medicine.

State Aid for the Tuberculous.—With funds appropriated by the 1939 legislature, the state department of health has begun a tuberculosis hospitalization service for indigent patients for whom collapse therapy is suitable. The new service is a statewide application of the short hospitalization and outpatient follow-up plan that has been used in many cities, the health department reports. Tennessee has no state-owned tuberculosis

hospitals, but a number of approved general hospitals distributed through the state are available. Hospitalization costs are met by funds supplied jointly by local communities and the state and treatment will be given by local physicians. The function of the new service is to correlate services and agencies already functioning and to furnish consultation when indicated. It is believed that the program will aid in health education, promote the use of established hospitals, provide some care that has hitherto not been available and provide data for further approach to the tuberculosis problem. Dr. Wilder W. Hubbard, Nashville, is in charge of the tuberculosis service, which is a unit of the division of preventable diseases in the state department of health. To assist in formulating policies an advisory council has been appointed with the following members: Drs. James L. Hamilton, Chattanooga; William S. Rude, Ridgetop; Charles M. Oberschmidt, Memphis; William J. Cameron, Sweetwater, and Dr. David Townsend, Bristol.

TEXAS

Millions Bequeathed to Advance Mental Hygiene.—The University of Texas has received a bequest valued at $2,500,000 from the estate of the late Will C. Hogg, Houston, an alumnus and at one time chairman of the university's board of regents. The major objective of the fund is the establishment of a statewide mental hygiene program under university supervision. Homer P. Rainey, Ph.D., president of the university, announced that the program would include establishment of mental hygiene clinics, promotion of mental health lectures at the university and in various parts of the state, provision of mental hygiene instruction in Texas teacher training courses and provision of facilities for research at the medical school in Galveston. It will go into operation as soon as funds are available.

District Meetings.—The Central Texas (Twelfth) District Medical Society met in Cleburne recently. The scientific program included addresses by Drs. Truman C. Terrell, Fort Worth, on "Chemotherapy in the Treatment of Pneumonia"; Arthur C. Scott Jr., Temple, "Total Thyroidectomy," and Eugene V. Powell, Fort Worth, "Advantages of Preoperative Radiation of Breast Malignancies." Drs. Leopold H. Reeves and Holman Taylor, Fort Worth, president and secretary respectively of the Texas State Medical Association, discussed organization activities.——Among speakers at a meeting of the Southwest Texas (Fifth and Sixth) District Medical Society, Corpus Christi, recently were Drs. William W. Bondurant Jr., San Antonio, on "Epidemic Myalgia"; Walter G. Reddick, Dallas, "Sulfapyridine in Pneumococcal Infections"; John Harolde Turner, Houston, "Evaluation of Operative Procedure for Prostatism," and James D. Casey, San Benito, "Acute Infectious Pancreatitis and Its Etiologic Relationship to Diabetes Mellitus." The program also included a symposium on anesthesia by Drs. Gustav A. Pagenstecher, Walter Herbert Hill and George H. Paschal, all of San Antonio.

VIRGINIA

Appointments to State Health Staff.—Dr. William Grossmann, epidemiologist of the state health department, Richmond, has been appointed director of the bureau of communicable diseases to succeed Dr. Goldsborough Foard McGinnes, who resigned to take charge of a special venereal disease control project in Tennessee. Dr. Jack B. Porterfield, Williamsburg, health officer of the Peninsula district, has been made epidemiologist. Dr. Edward M. Holmes Jr., formerly health officer of Fairfax County, has been appointed director of the division of venereal disease control.

Faculty Changes at Medical College.—New appointments at the Medical College of Virginia, Richmond, include Drs. Richard W. Fowlkes, Richmond, as associate professor of dermatology and syphilology, and Patrick H. Drewry Jr., Petersburg, as assistant professor of neuropsychiatry. The following promotions have also been announced:

Drs. Carrington Williams, Arthur S. Brinkley and Frank S. Johns to be professors of clinical surgery.
Dr. Oscar B. Darden, associate professor of neuropsychiatry.
Dr. John S. Horsley Jr., associate professor of surgery.
Dr. Howard R. Masters, associate professor of neuropsychiatry.
Dr. Henry S. Stern, associate professor of pediatrics.
Dr. Harry Walker, associate professor of medicine.
Drs. Louise F. Galvin and Samuel A. Anderson Jr., assistant professors of pediatrics.
Dr Harry J. Warthen Jr., associate professor of surgery and history of medicine.
Dr. George Z. Williams, associate professor of pathology.
Dr. Harvie DeJ. Coghill, assistant professor of pediatrics and neuropsychiatry.
Dr. Charles L. Outland, assistant professor of preventive medicine.

CANAL ZONE

Society News.—Dr. Oswald S. Lowsley, New York, addressed the Medical Association of the Isthmian Canal Zone August 31 at the Gorgas Institute, Panama City, on "New Developments in Operative Urology." Dr. Lowsley also addressed the Medical Association of Panama September 1 on "Further Experiences with a Plastic Operation for the Cure of a Certain Type of Impotence."

GENERAL

International Meeting on Rheumatism.—The Seventh International Congress on Rheumatism will be held in New York, Boston and Philadelphia June 1-10, 1940. Subjects for discussion will be infection, nutrition and treatment. Information may be obtained from the International Bureau, Keizersgracht 489, Amsterdam.

National Hearing Week.—The American Society for the Hard of Hearing has designated the week October 22-29 as the twelfth annual National Hearing Week. The society and its 170 local organizations will conduct an intensive campaign of public education, emphasizing the prevalence of hearing loss, the need of discovering incipient cases of deafness and the social and economic needs of those who already have a loss of hearing. President Roosevelt recently endorsed the work of the society in a letter to its president, Dr. Austin A. Hayden, Chicago.

Society News.—Dr. William P. Shepard, San Francisco, was made president-elect of the Western Branch of the American Public Health Association at the annual meeting in Oakland in July. Dr. Frederick D. Stricker, Portland, Ore., was installed as president.——Dr. Martin S. Kleckner, Allentown, Pa., was elected president of the American Proctologic Society at its recent annual meeting and Dr. A. W. Martin Marino, Brooklyn, vice president. Dr. Curtice Rosser, Dallas, Texas, was reelected secretary. The 1940 meeting will be held in Richmond, Va., June 9-11.

Second Pharmacopeia Supplement.—The Second U. S. Pharmacopeia XI Supplement containing new monographs for many substances and a revision of eighty-five monographs of the original U. S. P. XI is now available. A feature of the new supplement is a cumulative index that lists all U. S. P. titles and indicates where the present official monograph now in force may be found. Orders should be sent, accompanied by a check or money order, to the General Agent, Mack Printing Company, Easton, Pa. The price of the First U. S. P. XI Supplement is $1 and of the Second U. S. P. XI Supplement, which is considerably larger, is $1.50.

Conference on Nursery Education.—The biennial conference of the National Association for Nursery Education will have a special health session at its meeting in New York October 25-28 at the Hotel Pennsylvania. Speakers at the health session will be Mary Swartz Rose, Ph.D., Columbia University, New York, a member of the Council on Foods of the American Medical Association, on "Recent Trends in Nutrition Related to Child Development" and Dr. Harold C. Stuart, Harvard Medical School, Boston, "Significant Factors in the Appraisal of the Health of the Young Child." At other sessions Mrs. Jean MacFarlane, University of California, Berkeley, will report on "Implications of a Growth Study of 200 Children" and Dr. Mabel C. Huschka, New York, on "Recent Findings on the Physical Development of Young Children."

American Hospital Association.—The annual meeting of the American Hospital Association will be held in Toronto, Canada, September 25-29. Among the speakers will be:

Dr. Alfred K. Haywood, Vancouver, B. C., Should the Social Service Department Interview All Hospital Patients?
Dr. Frederick F. Tisdall, Toronto, Nutritive Requirements of the Patient During Disease and Convalescence.
Dr. Edwin L. Harmon, Valhalla, N. Y., The Use and Abuse of the Hospital Pharmacy.
Rev. Alphonse M. Schwitalla, St. Louis, The Place of the Government General Hospital in the Hospital Field.
Dr. Claude W. Munger, New York, Hospitals and Government in the United States.
Michael M. Davis, Ph.D., New York, Trends in Payment for Outpatient Care in Voluntary Hospitals.
Dr. Alan Brown, Toronto, How the Children's Hospital Can Best Meet Community Needs.
Dr. David E. Robertson, Toronto, Surgical Treatment of Infantile Paralysis.
Dr. Samuel Proger, Boston, Helping Hospitals and Practitioners in Small Communities.

In the tuberculosis section there will be symposiums on "Tuberculosis as an Occupational and Compensable Disease," "Safeguarding Hospital Personnel from Tuberculosis" and "Adequate Institutional Care for the Tuberculous."

Bequests and Donations.—The following bequests and donations have recently been announced:

The Cincinnati Antituberculosis League, $2,000 from the estate of the late Mrs. George B. Cox to finance a program of postgraduate work in tuberculosis for Negro physicians and nurses.

Hahnemann Hospital, $3,000, and St. Luke's and Children's Hospital, $2,000 from the will of Miss Emily Blackburne as gifts to Dr. John W. Frank, Philadelphia; also $1,000 to Children's Hospital.

Woman's Medical College of Pennsylvania, Philadelphia, $3,000 for a chair of anesthesia by the will of Elizabeth S. Hague.

Delaware County Hospital, Drexel Hill, Pa., about $6,000 by the will of Mrs. Mary E. Kirkpatrick.

Oneida City Hospital, Oneida, N. Y., $10,000; Children's Hospital Home of Utica, $10,000; St. Elizabeth Hospital, Utica, $5,000, and Faxton Hospital, Utica, $5,000 by the will of the late Mrs. Elizabeth R. Fitch.

Lenox Hill and Presbyterian hospitals, New York, $5,000 each by the will of the late August E. Vihlein.

Good Samaritan Hospital, Portland, Ore., $50,000 by the will of Nellie Stevens Wilcox.

St. Luke's Hospital, New York, about $145,000 from the estate of Mrs. Annabella Curtis, widow of the late Dr. R. Farquhar Curtis.

Hahnemann Medical College and Hospital, Philadelphia, won a $30,000 claim against the estate of Miss Laura Allen in settlement of a pledge said to have been made by her in 1927. She also left $30,000 in trust to the Broad Street Hospital.

Sanatorium Association of Philadelphia, $100,000 and a share in the residuary estate by the will of the late Mrs. Mary A. Combs.

Children's Hospital of Philadelphia will receive about $6,300 as residuary legatee under the will of Mrs. Caroline M. Bond.

St. Luke's and Children's Hospital, $3,000, and Methodist Hospital, the income from a $5,000 trust bequest, by the will of Miss Mary Zehnder. Both hospitals are in Philadelphia.

Philadelphia Shriners Hospital for Crippled Children, $25,000 by the will of Henry Dolfinger, Norristown.

Methodist Hospital and Hospital of the Protestant Episcopal Church, Philadelphia, and Children's Seashore House, Atlantic City, $5,000 each by the will of Mrs. Ida M. Vare.

Shriners Hospital for Crippled Children, Chicago, about $60,000 from the estate of the late U. J. Herrmann.

American Academy of Ophthalmology and Otolaryngology.—The forty-fourth annual convention of the American Academy of Ophthalmology and Otolaryngology will be held at the Palmer House, Chicago, October 8-13 under the presidency of Dr. George M. Coates, Philadelphia. There will be one general session Monday morning and succeeding mornings will be devoted to instructional courses. Section meetings will be held in the afternoons. At the general session Dr. Coates will deliver his official address and Dr. Burt R. Shurly, Detroit, will be introduced as the guest of honor and will make an address. There will be a symposium on "Essential Hypertension," presented by Drs. Albert C. Furstenberg, Ann Arbor, Mich., speaking from the standpoint of otolaryngology; Henry P. Wagener, Rochester, Minn., ophthalmology, and Roy W. Scott, Cleveland, the internist. Among speakers scheduled for the section meetings are:

Prof. Joseph Igersheimer, Istanbul, Turkey, The Optic Nerve and Diseases of Hypertension.

Dr. Arthur DeSa, Pernambuco, Brazil, Ethmoiditis.

Drs. Bennett Y. Alvis and Meyer Wiener, St. Louis, A New Technic for Corneal Transplantation by Means of a Uniform, Mechanically Obtained, Beveled Graft.

Dr. William M. Muncy, Providence, R. I., Relationship of Vitamin Deficiency to Trypansamide Reaction.

Dr. Otto Jason Dixon, Kansas City, Mo., A New Plastic Operation for the Relief of Conductive Deafness.

Dr. Frank J. Novak Jr., Chicago, Innocuous Oils Useful in Rhinologic Practice in Contrast to the Use of Hydrocarbon Oils.

Dr. Arthur W. Proetz, St. Louis, The Effects of Tobacco (Smoking) on the Respiratory Tract.

There will also be a program of motion pictures each afternoon alternating for the two specialties. The annual banquet will be Wednesday evening and alumni dinners Tuesday evening.

CANADA

Dr. Best Receives Baly Medal.—Dr. Charles H. Best, professor of physiology, University of Toronto Faculty of Medicine, has been chosen to receive the Baly Medal of the Royal College of Physicians of England, *Science* reports. This medal is awarded in alternate years to the person considered to have distinguished himself most in the field of physiology in the preceding two years. Dr. Best's work has dealt with insulin, carbohydrate metabolism, histamine, choline and recently heparin.

Personal.—Dr. Morley S. Lougheed has been appointed health officer of Winnipeg, Man., to succeed Dr. Alexander J. Douglas, who is retiring after nearly forty years of service. Dr. Lougheed has been city bacteriologist for several years. ——Dr. Herbert C. George, Regina, Sask., has been appointed medical director of cancer services for the Saskatchewan Cancer Commission and director of the Regina Cancer Clinic, and Dr. Allan W. Blair, Toronto, has been made supervisor of radiotherapy for the commission and radiotherapist of the clinic.

Deaths in Other Countries

Dr. Heinrich William Poll, for many years professor of anatomy at the University of Berlin and the University of Hamburg, died of coronary thrombosis June 12 in Lund, Sweden, aged 61. Mrs. Poll, also a physician, remained in Germany, and it is reported that she died by suicide August 5. Dr. Poll delivered the Flexner Lectures at Vanderbilt University, Nashville, Tenn., and lectured at other universities in the United States during the winter of 1928-1929. His studies were principally in physical anthropology, the endocrine glands and genetics.

CORRECTIONS

Dr. Rector Presided at Wisconsin Meeting.—In a notice of the annual meeting of the State Medical Society of Wisconsin September 13-15 in THE JOURNAL, September 2, page 951, it was said that the meeting would be "under the presidency of Dr. Raymond G. Arveson, Frederic." Dr. Albert E. Rector, Appleton, was the president for this meeting and Dr. Arveson was to be installed September 13 as president for the coming year.

Review of Clinical Gastroenterology by Dr. Horace W. Soper.—In the review of this book published in THE JOURNAL, September 2, the statement is made that some of the pictures represent reproductions of films of the late R. Walter Mills, and it is further stated that the author does not so designate. The author, Dr. Horace W. Soper, calls attention to the fact that credit is given to Mills on pages 60, 126, 150, 240 and 274.

Government Services

Changes in the U. S. Public Health Service

Dr. Joseph W. Mountin, senior surgeon, U. S. Public Health Service, has been relieved from his assignment in charge of public health methods at the National Institute of Health, Bethesda, Md., and detailed as assistant surgeon general in charge of the division of domestic quarantine. He succeeds Assistant Surgeon General Clifford E. Waller, who has been assigned to duty in the surgeon general's office in charge of the general inspection office. Drs. Walter L. Treadway and Joseph Bolten have been promoted from the grade of senior surgeon to that of medical director.

The Wellcome Medal

The Association of Military Surgeons of the United States announces the annual competition for the Wellcome Gold Medal and cash prize of $500, awarded "for researches, discoveries, inventions, designs, improvements, essays, or any other acts or deeds which the executive council of the association may consider desirable and helpful to the objects of the association, and relating to any phase of medico-military affairs and disease control associated with the army, navy, militia and public health and marine hospital service in times of peace or war at home or abroad." The competition is open to any member of or person eligible for membership in the Association of Military Surgeons of the United States. Additional information may be obtained from the secretary of the association, Army Medical Center, Washington, D. C.

Examination for the Regular Army Medical Corps

The War Department announces an examination December 4-8 for candidates for appointment as first lieutenants in the Medical Corps, Regular Army, to fill vacancies during the next fiscal year. The examination is open to all male graduates of acceptable medical schools who have completed one year's internship in an approved hospital and who will not be over 32 years of age at the time it will be possible to tender a commission. Boards of medical officers convened throughout the United States will conduct the examination, which will consist of a physical examination in professional subjects and a determination of the candidate's adaptability for military service. Full information and application blanks may be obtained from the Adjutant General, War Department, Washington, D. C. Applications will not be considered after November 18.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 19, 1939.

The War on Nerves

In an address to the National Council for Mental Hygiene entitled "Some Emotions and a Moral," Sir Walter Langdon-Brown said that if we were not at war we were not at peace. The production of nervous attrition was being followed deliberately as an aggresive policy in certain countries, and therefore new methods of defense were necessary. To insist, as some communities did, on utter obedience to the force of authority apparently simplified the task of coordinating units into a coherent whole, but at what ultimate cost to the nation and to the individual? Undue repression in the individual life, whether autonomous or imposed by parental or scholastic authority, made for psychosis and perversion, and a parallel could be drawn between the psychoneuroses of individuals and nations.

The motive force of fear was originally a defensive mechanism, but when fear became unreasoning it was a perversion of this mechanism. The sympathetic nervous system, which superintended many of the functions of organic life, retained some of the primitive features of the nervous system of the lower animals. The condition of continued fear, whether recognized or not as such by the sufferers, was capable of producing the symptoms of which they complained. Why did the neurotic individual refer so many of his symptoms to disorders of various organs? Emotional disturbance led to widespread preparation for imminent activity. The activity never found its occasion, but the disturbance persisted. In the international situation we now saw a deliberate attempt to exploit mass psychology by manifold suggestions calculated to excite fear and evoke a defeatist attitude. Fear was closely associated with the same nervous mechanisms as prepared the body for action and was intensified if action did not result. If fear could be mobilized into defensive action, to a large extent it would cease to be felt as fear. The best antidote for this long drawn out war on the nerves was active cooperation in some form of national service.

Nutrition in the British Colonial Empire

The great attention being given to nutrition in Great Britain is not confined to the home country. A report on nutrition in the colonial empire, prepared by a committee of the Economic Advisory Council, has just been published. The committee has no doubt that improved nutrition could bring great benefit, not so much by eradication of disease as by general improvement in the standard of well being. The colonial dietaries are predominantly vegetarian, only small quantities of animal food being consumed in most parts and milk rarely. The diets are low in first class proteins, fats, green leafy vegetables and fruits. Calcium and phosphorus and all the vitamins except vitamin D are widely deficient. The low standard of life, ignorance and prejudice are the causes of prevalent malnutrition.

The remedy is largely one of economic development, which means improvements in agriculture, by which the people predominantly live. Family production of food to meet family needs would be a safeguard against the effects of fluctuations of income from money crops. A combination of cereals and legumes would be valuable and the soya bean is especially recommended for cultivation, as also are groundnuts, red palm oil, fruits and green leafy vegetables. An increase of animal husbandry is desirable. Milk in anything comparable to its use in Western dietaries is not possible. Improvement of fishery might be more important than any other reform. The evil of removing vitamin B in the milling of rice is now an old story, but the report states that even the most highly milled rice may contain nearly adequate quantities of the vitamin if it is properly stored and cooked. The infant mortality is high in many parts of the colonial empire and one of the main causes is unsuitable feeding. This may be connected with social habits, as in the case of Jamaica, where 71 per cent of the births are illegitimate. The government has now for the first time material for framing a policy which is fundamental to the welfare of the colonial peoples. It has arranged that the local surveys shall be coordinated by staff work under the Medical Research Council.

Government Plans for Food in War Time

War time plans for controlling the nation's food supplies in war by a minister of food, which would work through nineteen regional offices, are complete. They are based on the government becoming the sole purchaser of all imports. Already large purchases of storable food, such as wheat and whale oil, have been made. This action would eliminate speculation, and all food prices, except those of luxuries, will be controlled. Wholesalers would purchase from the government and would operate according to orders. Retailers would be registered and licensed by one of the 1,400 local committees already appointed. They would purchase from wholesalers at prescribed prices regular weekly supplies and sell to the public at prices fixed by order, which would leave a fair margin of profit. Immediately on the outbreak of war, five staple classes of commodities would be rationed. They are (1) butcher's meat, (2) butter and margarine, (3) bacon and ham, (4) lard dripping and other cooking fats and (5) sugar. In case of emergency 19 million household application forms and 60 million ration cards are already printed. A more detailed scheme is being worked out providing for additional rations for certain classes of workers. Food committees controlling the local arrangements could be established at a few hours notice. It is reckoned that ten days would be required to transfer private trading to the government controlled system. Afterward shipment and buying would be entirely in the hands of the government. Existing importers would continue to handle imports, but as agents for the government. Factories would also operate under direction. Two of London's biggest markets—Smithfield (meat) and Billingsgate (fish)—would be closed immediately on the outbreak of war and their functions transferred to railheads on the outskirts of London. Special arrangements are being made for the feeding of the population to be evacuated from the cities and towns to safer areas. Already forty-eight hours' free supply is ready, which would give traders time to make the necessary adjustments in reception areas. This supply consists of canned beef, condensed milk, biscuits and chocolate. The huge reserves now stored include sufficient wheat until the next harvest.

Spontaneous Rupture of the Gallbladder

Perforation of the gallbladder from inflammatory changes associated with gallstones is relatively common, but massive hemorrhage is so rare in such cases that, since the first case reported to the Pathological Society of London in 1858 by Leared, only four similar cases have been recorded. The last was reported by the Bartletts of St. Louis in THE JOURNAL Feb. 22, 1936. A sixth case has just been reported by Mr. Robert Mailer of Glasgow (*Brit. J. Surg.* **27**:91 [July] 1939). A retired policeman, aged 65, was admitted to the Victoria Infirmary with the diagnosis of intestinal obstruction. Up to a week before he had been in excellent health. He then began to suffer from vague abdominal pain, which did not prevent him from going about as usual. On the day before admission, pain in the lower part of the abdomen became more severe and he vomited brownish material. He suffered from constipation, no flatus was passed, and some abdominal distention was present. There was slight cyanosis round the lips. The tongue was furred and the abdomen slightly distended and tender in the lower half, and there was diffuse resistance to palpation.

Rectal examination was negative. As there was no response to two enemas the abdomen was opened. It contained from 3 to 4 pints of partly clotted blood. The intestinal loops were moderately distended but there was no obstruction. The source of hemorrhage was found to be a 1 inch rent in the fundus of the gallbladder. There was a large gallstone. As the patient's condition was precarious, a tube was passed through the rent and the gallbladder was packed round with gauze and the abdomen hurriedly closed with sutures. The patient died three hours later. At the necropsy the wall of the gallbladder was found thickened and hemorrhagic, and near the perforation it was necrotic. The pathologic picture was one of hemorrhagic infarct of the gallbladder wall due to interference with the venous return by the pressure of a large gallstone.

The Journal of Endocrinology

The large and rapidly increasing publicity work on endocrinology by British investigators has made it desirable to bring together in a single British journal papers now scattered over many different periodicals. A new publication, the *Journal of Endocrinology*, has therefore been founded under a Council of British endocrinologists (P. M. F. Bishop; Prof. F. A. E. Crew, F.R.S.; Sir Henry Dale, F.R.S.; Prof. E. C. Dodds; Prof. C. R. Harrington, F.R.S.; Prof. G. E. Marrian; Dr. F. H. A. Marshall, F.R.S.; A. S. Parkes, F.R.S.; Dr. F. G. Young, and Dr. Solly Zuckerman). Professor Dodds is the editor and Dr. R. L. Noble the assistant editor. The *Journal* will be published quarterly by the Oxford University Press, Amen House, Warwick Square, London, E. C. 4. The address of the American branch is 114 Fifth Avenue, New York. The annual subscription is $30. The first number runs to 116 quarto pages and is well illustrated. The titles of the articles show that the intensely active subject of endocrinology is being well covered.

PARIS

(From Our Regular Correspondent)

Aug. 5, 1939.

Bureau of Hygiene of the League of Nations

If the League of Nations is dissolved for political reasons, means ought to be found to retain several functions of this organization, among them the International Bureau of Labor and the Bureau of Hygiene. If the Bureau of Hygiene did not exist, to adopt Voltaire's words, one ought to invent it, for it centralizes not only all that concerns the science and teaching of hygiene but all the practical applications as well. For this reason four great nations that have severed their connection with the league have nevertheless asked to be allowed to continue their participation in the health services which it directs. Parisot of Nancy, chairman of the committee on hygiene, recently emphasized the fact that, far from being discouraged by the resignations from the league, induced by national rivalries, the committee on hygiene ought to redouble its efforts, because the peoples of these nations need the close cooperation between science and sociology that transcends political ideologies and national conflicts. Professor Turumi, following Japan's resignation from the League of Nations, had to relinquish his functions as chairman. Dr. Rajchmann, who had rendered eminent services since his nomination in 1921, withdrew on reaching the retirement age.

Among the topics discussed at this meeting the fight on cancer was first. A special committee was created for this purpose. The Bureau of Hygiene will also participate in the Pan-African Conference on Sanitation to be held next year at Nairobi. At the request of nineteen countries, it will also call an intergovernmental conference on antimalarial therapies to meet next year. In consequence of Professor Madsen's discussion of the incidence of tuberculosis among medical students, the need of studying the health of university students was stressed.

Alcoholic Coma in Children

Alcoholic coma in children is not so infrequent as one would suppose. Debré reported two cases to the Society of Pediatrics. The first concerned a child aged 4 years who rapidly swallowed more than a pint of red wine. He fell into a heavy torpor with dyspnea, edematous rales and stertor. Diagnosis indicated postepileptic coma and hypoglycemia, until the empty bottle was found. Gastric lavage was resorted to, followed by symptomatic treatment. The intoxication passed off on the third day without effects. The other child was 9 years old and had swallowed two large glasses of wine. Analogous symptoms occurred except that the coma was preceded by violent agitation. The child recovered in response to similar treatment. A peculiarity of these intoxications was that the breath of the children did not smell of alcohol or wine, which made the detection of the cause more difficult.

Prognosis, however, is far from being always favorable. Génévrier and Fèvre at the same meeting cited two cases in which the cure was uncertain. A child aged 3 years had drained all bottles left over from a banquet and even smoked ends of cigarets scattered on the table. Besides coma he manifested vomiting, loose and sanguineous stools and intussusception. An operation was followed by icterus, vomiting and violent agitations. The child, however, completely recovered. The other child had become intoxicated through excessive doses of rum therapeutically given. Recovery was slow. A fatal dose would contain 7 cc. of pure alcohol per kilogram. In the cases mentioned the alcohol content did not exceed 2 cc. Intubation is the treatment of urgency and is confirmatory, at the same time, of the diagnosis.

University News

The following appointments are announced at the Faculty of Medicine of Paris: Dr. Aubertin, professor of therapeutics; Dr. Henri Bénard, professor of experimental pathology; Dr. Lévi Valensi, professor of the history of medicine, and Dr. Velter to the chair of ophthalmology.

Prof. André Hovelacque, head of the department of anatomy at the Faculty of Medicine of Paris and son of the anthropologist, has just died.

Prof. René Froëlich, who has taught pediatric surgery at Nancy for forty years, has retired.

BERLIN

(From Our Regular Correspondent)

Aug. 3, 1939.

Alcohol, Tobacco and Coffee

A report was made in the Berlin letter of April 10 (THE JOURNAL June 3, p. 2339) regarding a nationwide meeting on public health and stimulants. Here are a few interesting additional items. Professor Reiter, president of Germany's department of public health, read a voluminous paper on stimulants and efficiency. His definition of "addiction" was so vague that it scarcely commends itself. He said "One may speak of 'addiction' whenever the inhibitions against the use of a stimulant fail. Such inhibitions concern the individual, his family and the public; their failure harm all." He said "Alcoholism affects mostly the age level of 35-54, especially the 35th to the 44th year. In individual diseases accompanied with inability to work alcoholic persons show excess in relation to the normal rate (100) in the following proportions: nervous diseases, 400; organs of movement, 286; organs of digestion, 285; organs of circulation, 273; accident, 258. General incidence of disease among alcoholic persons (normal rate 100) is indicated by the following figures: 15-24 years, 180; 25-34 years, 264; 35-44 years, 283; 45-54 years, 261; 55-64 years, 266; 65-74 years, 293. Abuse of alcohol leads to increased occupational accidents. For example, 171.4 accidents were reported per thousand insured workers employed in breweries. This represents the highest

accident rate for industries. According to the most recent reports of the central traffic department of the government for 1938, of all automobile drivers' licenses withdrawn, 9,069 in number, 4,307 were withdrawn on account of intoxication. He further stated that of late years degenerative and histologic modifications were observed in the scrotal tissues of habitual drinkers, observations that the government was planning to follow up. Reiter then inveighed against the use of tobacco. Injury to health and lessening of efficiency have become of late more manifest. Use of tobacco clearly affects and lowers the mental ability of youthful persons. Physical achievement is also disturbed; tobacco at first heightens it and then induces an abrupt descent. Examinations for military service of adolescents of 19 to 20 years of age revealed physical defects in a large number. Reiter also called attention to the close connection between cigaret smoking and physical and mental susceptibility to disease and the disturbances of the normal sexual life. Abuses of this kind, he said, would be vigorously combated by the government, as well as "the increasingly shameless methods of advertising."

The first effective measure in this direction was taken by Goering, commander-in-chief of aviation, with the publication of a decree affecting military fliers. Without seeking to condemn all use of alcohol and tobacco, he announced the following prohibitions: the opening of "bars" for the consumption of liquor within the limits; standing or sitting around tables where alcoholic beverages are dispensed; selling whisky to soldiers already intoxicated; consumption of alcohol immediately before and during duty, especially duty on airplanes and automobile service; sales of foreign wines within the precincts; smoking on village streets, on marches and in brief periods off duty; the sale of foreign tobacco merchandise; keeping casinos and canteens open beyond locally permitted hours (prohibitive also for officers); company festivities in rooms and homes. Similar orders have been issued to the army and navy. They are mandatory also when the soldier is in civilian clothes.

As to coffee, Goebbels wrote an article in the *Völkischer Beobachter* in which he stigmatizes the use of coffee as an unpatriotic act. He clearly appeals to economic, not to hygienic, considerations. As a matter of fact, the per capita consumption of coffee in Germany is already lower than that of other countries. That all these restrictions are primarily concerned with questions of money and not with public welfare is evidenced by the quotation from Goering's decree: "Moreover, in restricting the use of alcohol and nicotine, we make economies in foreign exchange which we need more imperatively for other new materials." Utterances like these revive the memory of the governmental propaganda, conducted a few years ago when the new régime first came into power, against lemons as a "wanton fruit of the south" and of the recommendations of indigenous fruits.

The Nicotine Content of Tobacco Products

New regulations have been published defining the presence or absence of nicotine in tobacco. Only such cigarets, cigaret tobacco and pipe tobacco may be designated as possessing a low nicotine content which do not have more than 0.6 per cent of nicotine (in its dry state); likewise cigars and cigar tobacco with no more than 0.8 per cent nicotine content. The term "free from nicotine" may be applied to tobacco and cigars with no more than 0.1 per cent and to cigarets with no more than 0.2 per cent of nicotine (in its dry state). Tobacco and tobacco products may be designated as "naturally of low nicotine content" or "naturally free from nicotine" if they are indebted for the low nicotine content required by law solely to the use of tobacco leaves so cured as to present these characteristics. If, in consequence of special additions or measures, less nicotine finds its way into the smoke, the following designations may be permitted: tobacco "free from nicotine in the smoke" if the nicotine content of the smoke does not exceed 0.3 per cent; cigarets and pipe tobacco "with low nicotine smoke content" if they do not possess more than 0.17 per cent of nicotine; cigars, if they contain no more than 0.1 per cent (interpreted as applying to the amount of tobacco consumed having a water content of from 8 to 10 per cent). Only such preparations may be advertised or put into circulation as means to reduce the nicotine content in the smoke as are effective in removing at least 50 per cent of the nicotine that appears in the smoke in normal average tobacco. The following terms are especially to be regarded as "misleading": statements like "weak in nicotine," "nicotine neutral," "free from poison," "poison removed"; likewise (apart from the instances mentioned) all designations and statements calling attention to a low nicotine content; likewise all numerical references relating to the nicotine content so far as they are not expressly permitted; finally, expressions calling attention to the use of tobacco in promoting health or as containing nothing in any way hygienically objectionable.

According to investigations undertaken last year by Germany's department of health, no brand of cigaret showed a nicotine content under 7 per cent. It would seem that the new regulations sound the knell of cigarets advertised as "low in nicotine." Some firms have been able to reduce the nicotine content by blending specially selected tobaccos. Within the last years not more than about twenty brands really or allegedly low in nicotine appeared on the German market, but only about three of them are likely to possess a nicotine content of less than 8 per cent. The extent to which cigarets low in nicotine are sold is often overestimated and may not rise above 4 per cent of the total tobacco consumption. It is questionable in view of the more rigorous regulations whether brands "low in nicotine content" will appear at all in trade. Tobacco manufacturers may not advertise their products as health promoting nor represent the use of tobacco as a sign of manliness nor ridicule opponents of tobacco. They may not make advertising appeals to women and those interested in sports nor picture smokers at the wheel of the automobile.

Beta Carotene and Vitamin A in Whales

K. H. Wagner presented a report before the Biological Society in Leipzig of his exploratory trip to the Danish Faroe Islands (situated between Norway and Iceland), which he undertook in behalf of Professor Scheunert, nutritional physiologist of Leipzig, for the purpose of vitamin research on whales. Investigations of all organs of freshly killed whales (blue whales, fin whales and sperm whales) to determine vitamin A and beta carotene content, were conducted at the whaling station of Lopra by means of chemical and physical methods. The organs of the same species were found to possess an almost constant vitamin content; between the different species certain variations occurred. Difference of sex played no part in vitamin content. On the other hand, the vitamin content of the animals' organs increased with age. Vitamin A was regularly found in the liver, heart, kidney, muscles, flesh and blubber but not always in the lung and spleen. Its content in the blood, milk and urine was nearly regular. The following observations in blue and fin whales may be of interest: The vitamin A content of the muscle, indicating 300 international units, was no higher on the average even in the musculature of the heart. In the case of the spleen and lung, the values fluctuated between 0 and 250 international units. To explain these great differences, Wagner referred to the difference in blood content of the organs. The high vitamin A content of the blubber was noteworthy, on an average 17,000 international units per hundred grams. Most richly supplied with vitamin A, amounting to 10,000 international units per gram, was the liver. In two pregnant fin whales the thickness

of the blubber was surprisingly below normal (far over half) and the vitamin A content of the blubber was also less by more than one half. The vitamin content in the other organs corresponded to those of nonpregnant animals. Attention was specially directed to the vitamin A content of the thyroid gland. The normal average of 300 international units rose in pregnancy fivefold and more (from 1,470 to 1,720 international units in a thyroid gland of 100 Gm.). The thyroid gland, therefore, plays a significant part during pregnancy in vitamin A metabolism; on the other hand, the vitamin A content of the liver of pregnant whales fell. Also in the case of suckling females the content of the thyroid gland was 300 per cent higher (860 international units) than the normal average. The sperm whales possessed a much greater vitamin A content than the other two species. The values found in lung, spleen, kidney and pancreas of 100 Gm. ranged from 1,100 to 2,000 international units. Even in the heart, average values of 1,700 international units could be discovered. Likewise the average content of the blubber in sperm whales, amounting to 20,000 international units per hundred grams, exceeded that of the blue and fin whale. The highest content of vitamin A was found in the liver of the sperm whale (28,000 international units to a gram). At present the vitamin A content of whales is not being utilized therapeutically.

STOCKHOLM

(From a Special Correspondent)

Aug. 15, 1939.

Poliomyelitis Research

Prof. C. A. Kling, director of the state bacteriologic laboratory in Stockholm, is engaged in collecting and sifting the records of some 8,000 cases of infantile paralysis which occurred in Sweden in the period 1933-1938. With information on the geographic and chronologic distribution of these cases, it is hoped that valuable light may be thrown on the association, if any, of the disease with certain waterways. Information may also be forthcoming with regard to regional immunity, endemic foci, the part played by healthy carriers, and the reservoirs of the disease at periods when it seems to have died out. These investigations will require the aid of well qualified statisticians. The use and the misuse of statistics have lately been warmly debated in connection with poliomyelitis research. Dr. Jönsson's statistical study of the incidence of poliomyelitis in Sweden led him to challenge the accepted opinion that poliomyelitis is essentially a disease of rural communities in thinly populated areas. His conclusion that the disease is in reality just as frequent in cities has raised a hue and cry against him. Dr. Wernstedt, an authority on the epidemiology of poliomyelitis and one of the founders of the doctrine which classes poliomyelitis as an essentially rural disease, pounced on Dr. Jönsson at a meeting of the Swedish Medical Society and in the medical press. Dr. Jönsson, it would seem, has combined an inadequate clinical and epidemiologic knowledge of poliomyelitis with a faulty interpretation of statistical technic. So much for Dr. Wernstedt's opinion of Dr. Jönsson's work. In the opinion of Professor Kling and many other Swedish authorities there can be no doubt as to the comparative liability of rural communities to suffer from poliomyelitis.

Better Wells for Rural Communities

Prince Carl, brother of the king of Sweden and president of the Swedish Red Cross Society, announced at the annual meeting of this body that it is about to engage on a campaign for better wells and drinking water in rural areas. Surveys in this field have shown a great need for reform. Dr. A. Bergstrand has inspected some 400 wells in the rural district to which he is attached, and in between 20 and 30 per cent he found that the well curbs were of poor quality, rotten wood. In only 12 per cent of all the wells did they communicate by a pipe with the kitchen of the house. Another survey, conducted by Dr. C. A. Yllner, has dealt with the whole country, questionnaires being sent to the public health authorities of urban and rural communities. A surprising outcome of this investigation is that even in certain large cities the drinking water was not provided under absolutely reliable public health conditions. As for the municipal communities, mainly rural, it was the exception rather than the rule to find adequate provision made for the purification of the surface water. It would seem, therefore, that the contemplated educational campaign should be directed not only to the farmer but also to certain engineers and other public health officials responsible for the supply of water to cities.

The Late Professor Josephson

The death, May 10, of Prof. Carl David Josephson marked the passing of a great personality in the Swedish medical world. Born in 1858 in Stockholm, here he passed the last years of his life after having spent many of them in Uppsala. His family, which migrated into Sweden from Brandenburg more than a century ago, has been prolific in men who have made their mark in the history of Sweden. He was not yet 30 when he published a mature study of ureterogenital fistulas in women. This was the forerunner of a series of important gynecologic and obstetric studies the publication of which was continued throughout his long professional career. He was quick to realize that an obstetrician and gynecologist is apt to be left handed, metaphorically speaking, if he does not master the manipulative side of surgery. So he perfected operative technic. He also explored the field of pediatrics, in which he came to be recognized as an authority. Thus equipped he acquired an extensive and remunerative practice in Stockholm, where he would doubtless have remained if the amassing of a fortune had been his chief aim in life. But in 1909 he was invited by the University of Uppsala to succeed Professor Lindfors, and in duty bound he did not refuse. Here he continued to develop his gynecologic and obstetric interests and to publish at home and abroad one communication after another on these subjects. The treatment of cystitis with silver nitrate irrigation, conservative renal surgery, the radiologic diagnosis of renal tuberculosis, the treatment of prolapse of the uterus, cesarean section and the treatment of lesions of the peritoneum were among the subjects to which he devoted special attention.

Marriages

FRANCIS PATTERSON WELLS, first lieutenant, M. C., U. S. Army, to Miss Alice Hobson Haynes of Washington, D. C., July 1.

HAROLD SAMUEL WRIGHT, Norwood, N. Y., to Miss Ruth Elvira Barclay at South Orange, N. J., June 8.

ANDREW J. TOMAN, Chicago, to Miss Emily Marianne Serhant of Berwyn, Ill., in Oak Park, Ill., in June.

DENSMORE THOMAS, Niles, Ohio, to Miss Dorothy Yarbrough of Winston-Salem, N. C., in July.

CARL GIFFORD WHITBECK, Hudson, N. Y., to Miss Virginia Loftin of Washington, D. C., July 1.

WILLIAM S. WALDRON, Yonkers, N. Y., to Miss Betty Gabriel of Savannah, Ga., July 11.

JOHN MILES KRUPKA, Berwyn, Ill., to Miss Evelyn Phyllis Kotrba in Chicago, August 2.

HOMER D. UNDERWOOD, Cleveland, to Miss Irene E. Merten of Lorain, Ohio, in July.

LEWIS K. TESTER, San Angelo, Texas, to Miss Ophelia Hurdt of Bowie, June 1.

JOSEPH E. WALTON, Homer, Ill., to Miss Wanda Lee Lorton of Shumway, June 12.

MARY RUTH JACKSON to Mr. Dan McClung, both of Dallas, Texas, July 1.

Deaths

Louis Henry Fligman, Helena, Mont.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1901; vice president and past president of the state board of health; member and past president of the Medical Association of Montana; governor and fellow of the American College of Physicians; consulting internist to the Veterans Administration Facility; past president and secretary of the Lewis and Clark County Medical Society; lieutenant commander, Medical Reserve Corps of the United States Navy; aged 60; internist to St. John's Hospital and St. Peter's Hospital, where he died, July 14, of complications following an operation for appendicitis.

Howard McIlvain Morton, Vincentown, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; fellow of the American College of Surgeons; past president of the Minnesota Academy of Ophthalmology and Otolaryngology; professor of diseases of the ear and eye, Hamline University, 1893-1895; served during the World War; at various times on the staffs of the Minneapolis General, St. Barnabas, Fairview and Swedish hospitals, Minneapolis; aged 71; died, July 19, of Hodgkin's disease.

John Andrew Murphy, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1903; member of the Medical Society of the State of Pennsylvania; assistant professor of clinical immunology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; served during the World War; on the staffs of the Presbyterian and the Germantown hospitals, Philadelphia, and the Abington (Pa.) Memorial Hospital; aged 59; died, June 13.

Walter Stuart Galbraith, Lethbridge, Alta., Canada; McGill University Faculty of Medicine, Montreal, Que., 1899; past president of the Council of the College of Physicians and Surgeons of the Province of Alberta, and the Alberta Medical Association; formerly mayor and member of the school board; fellow of the American College of Surgeons; attending surgeon to the Galt Hospital and St. Michael's General Hospital; aged 72; died, July 16.

William Lane Wilbur ● Hightstown, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1888; president of the state board of medical examiners; health officer and school physician; at one time county sheriff; past president of the Mercer County Medical Society; at one time member of the state legislature; aged 74; died, June 11, in the University of Pennsylvania Hospital, Philadelphia.

Eugene Silas Strout ● Minneapolis; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891; an Affiliate Fellow of the American Medical Association; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staffs of the Hillcrest and Northwestern hospitals; aged 76; died, June 25, of coronary occlusion.

John Cook Baldwin ● Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1915; member of the American Academy of Pediatrics; served during the World War; on the visiting staffs of the Hospital for Women, Johns Hopkins Hospital, Union Memorial Hospital and the Church Home and Infirmary; aged 52; died, July 3, of coronary thrombosis.

Maude A. Bowyer, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1898; member of the Medical Society of the State of Pennsylvania; for many years physician to the Juvenile Municipal Court and examining physician at the House of Detention; aged 75; died, June 2, in the Misericordia Hospital of carcinoma of the larynx.

William W. Whittington, Snow Hill, N. C.; Louisville (Ky.) Medical College, 1895; member of the Medical Society of the State of North Carolina; past president of the Greene County Medical Society; county physician; veteran of the Spanish-American War; prison camp physician; aged 69; died, June 12, of coronary thrombosis.

Ellis Harvey Andrews ● Peru, Ind.; Kentucky School of Medicine, Louisville, 1901; past president and secretary of the Miami County Medical Society; for many years member of the county school board; on the staff of the Dukes-Miami County Memorial Hospital; aged 68; was killed, July 17, in an automobile accident.

Arthur Everett Crow ● Uniontown, Pa.; Jefferson Medical College of Philadelphia, 1903; member of the House of Delegates of the American Medical Association from 1925 to 1927; fellow of the American College of Surgeons; on the staff of the Uniontown Hospital; aged 61; died, June 3, of cerebral hemorrhage.

Frank Staples Bachelder, Pontiac, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1905; member of the Michigan State Medical Society; formerly secretary of the Oakland County Medical Society; served during the World War; aged 61; died, July 17, of coronary thrombosis.

R. Cloyd Smith, Wichita Falls, Texas; University of Louisville (Ky.) Medical Department, 1893; member of the State Medical Association of Texas; past president of the Wichita County Medical Society; on the staff of the Wichita General Hospital; aged 76; died, June 3, of cerebral hemorrhage.

Gustav Seeligmann ● New York; Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg, Baden, Germany, 1887; fellow of the American College of Surgeons; consulting gynecologist to the Lenox Hill Hospital and Dispensary and the Lebanon Hospital; aged 78; died, June 21, of leukemia.

Arthur Edward Ardagh, Orillia, Ont., Canada; Trinity Medical College, Toronto, 1888; coroner; at one time president and for many years a councillor of the Ontario College of Physicians and Surgeons; past president of the Orillia Hospital Board; aged 73; died, July 25, of heart disease.

Emerson Ward Hitchcock, Auburn, N. Y.; New York Homeopathic Medical College and Hospital, 1890; member of the Medical Society of the State of New York; on the staff of the Auburn City Hospital; aged 76; died, June 26, of angina pectoris, nephritis and chronic myocarditis.

William H. Rankin, Garden City, N. Y.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1889; fellow of the American College of Surgeons; formerly on the staff of St. John's Hospital, Brooklyn; aged 74; died, June 2, at his summer home near Kingston, Ont.

Donald Barton McHenry ● Danville, Pa.; Jefferson Medical College of Philadelphia, 1915; past president of the Montour County Medical Society; served during the World War; on the staff of the Bloomsburg Hospital; aged 48; died, June 4, of cardiovascular disease.

John Thomas Butler, Brookhaven, Miss.; Bellevue Hospital Medical College, New York, 1880; member of the Mississippi State Medical Association; physician to the Whitworth College for many years; aged 85; died, June 19, in the King's Daughters' Hospital.

Arthur James Ross, Perry, Iowa; College of Physicians and Surgeons, Keokuk, Iowa, 1880; Bellevue Hospital Medical College, New York, 1884; member of the Iowa State Medical Society; aged 82; died, June 19, of injuries received in an automobile accident.

Benjamin Harrison Holmes ● Racine, Wis.; Marquette University School of Medicine, Milwaukee, 1913; member of the American Academy of Ophthalmology and Otolaryngology; served during the World War; aged 51; died, June 29, of coronary occlusion.

Walter Harry Grimwood, Fort Madison, Iowa; Keokuk Medical College, 1898; served during the World War; for many years a member of the board of education; aged 76; died, June 20, in Rochester, Minn., of chronic cholecystitis with stones.

George McGrath, Hamilton, Mont.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1893; member of the Medical Association of Montana; aged 73; on the staff of the Marcus Daly Memorial Hospital, where he died, June 20.

Archibald Stephen Knight, Rochester, N. Y.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1897; member of the Medical Society of the State of New York; aged 69; died, June 29, of coronary thrombosis and arteriosclerosis.

John Worth Gray, Oklahoma City; Washington University School of Medicine, St. Louis, 1906; member of the Oklahoma State Medical Association; aged 66; died, June 18, at the Mayo Clinic, Rochester, Minn., of carcinoma of the stomach.

George Michael Flanagan ● New Britain, Conn.; College of Physicians and Surgeons, Boston, 1911; aged 62; died, June 13, in the New Britain General Hospital of cerebral hemorrhage, hypertensive heart disease and arteriosclerosis.

William Christian Heisey ● McKeesport, Pa.; Jefferson Medical College of Philadelphia, 1905; served during the World War; on the staff of the McKeesport Hospital; aged 58; died suddenly, June 21, of coronary occlusion.

Henry Jonas Wickert, Milford Square, Pa.; Jefferson Medical College of Philadelphia, 1888; member of the Medical Society of the State of Pennsylvania; aged 76; died, June 8, in the Quakertown (Pa.) Hospital.

John Albert Gillespie, Kingsburg, Calif.; Drake University Medical Department, Des Moines, Iowa, 1888; College of Physicians and Surgeons, Chicago, 1895; aged 77; died, June 14, of intra-abdominal carcinomatosis.

Marshall B. West ● Catonsville, Md.; University of Maryland School of Medicine, Baltimore, 1901; on the staff of St. Agnes' Hospital, Baltimore; aged 62; died, June 9, of hypertensive cardiovascular disease.

Abram Meyer Zucker, Sharon, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1923; member of the Medical Society of the State of Pennsylvania; aged 42; died suddenly in June.

Wilburn Jackson Winter, Chattanooga, Tenn.; University of Tennessee Medical Department, Nashville, 1903; member of the Tennessee State Medical Association; aged 66; died, June 5, of coronary occlusion.

Ferdinand Alonzo Wenger, St. Paul; Minneapolis College of Physicians and Surgeons, 1904; formerly on the staff of the West Side General Hospital; aged 63; died, June 6, of coronary sclerosis.

Adele L. Palmitier, Brooklyn; Eclectic Medical College of the City of New York, 1889; member of the American Society of Anesthetists; aged 81; died, June 12, of heart disease and arteriosclerosis.

Leonard Arthur Turner, Shelbyville, Ky.; Kentucky University Medical Department, Louisville, 1906; member of the Kentucky State Medical Association; aged 56; died, June 30, of carcinoma.

Carl Edwin Allison, Wakefield, Mass.; Tufts College Medical School, Boston, 1914; member of the Massachusetts Medical Society; aged 50; died, June 9, in Chelsea of hypertensive heart disease.

Milton Preston James, Brooklyn; Birmingham Medical College, 1911; for many years member of the state tax division of the U. S. Department of Internal Revenue; aged 54; died, June 21.

Charles Trangath Noecker, Waterloo, Ont., Canada; University of Toronto Faculty of Medicine, 1886; medical director of the Dominion Life Insurance Company; aged 74; died, June 16.

Emma Julia Wagner, Somerville, Mass.; Tufts College Medical School, Boston, 1905; member of the Massachusetts Medical Society; aged 76; died, June 12, of arteriosclerosis.

Durwood Leigh Dodd, Aspermont, Texas; Baylor University College of Medicine, Dallas, 1922; formerly health officer of Austin; aged 41; was shot and killed, June 30.

Charles Thomas Price, Point, Texas; Gate City Medical College, Dallas, Texas, 1906; St. Louis College of Physicians and Surgeons, 1912; aged 67; died, June 30, of pneumonia.

Clement E. Ryan ● Appleton, Wis.; Louisville (Ky.) Medical College, 1902; aged 69; on the staff of St. Elizabeth Hospital, where he died, June 3, of coronary occlusion.

John Andrew Meldrum, Guelph, Ont., Canada; University of Toronto Faculty of Medicine, 1883; at one time medical health officer of Weston; aged 81; died, June 24.

Kenneth Brown Rothey, Elizabeth, Pa.; Duke University School of Medicine, Durham, N. C., 1933; aged 30; died, June 17, in St. Francis Hospital, Pittsburgh.

Fairbairn McLennon Liverpool, Raleigh, N. C.; Howard University College of Medicine, Washington, D. C., 1937; aged 35; died, June 4, of pulmonary tuberculosis.

Joseph Francis Foley, Wilton, N. H.; School of Medicine and Surgery of Montreal, Que., Canada, 1904; aged 57; died, June 25, in St. Joseph Hospital, Nashua.

Frank Edwin Snider, Cincinnati; Medical College of Ohio, Cincinnati, 1897; aged 67; died, June 4, of chronic myocarditis, arteriosclerosis and cerebral hemorrhage.

Herbert F. Shaw, Mount Vernon, Maine; College of Physicians and Surgeons, Boston, 1883; aged 83; died, June 19, of chronic myocarditis and arteriosclerosis.

Benjamin Franklin Brubaker, North East, Pa.; Medico-Chirurgical College of Philadelphia, 1893; aged 80; died, June 7, of acute bronchitis and nephritis.

William P. Ross, Madisonville, Ky.; University of Louisville Medical Department, 1885; formerly mayor; aged 75; died, June 8, of carcinoma of the rectum.

Joseph Franklin Gill, Dallas, Texas; Memphis (Tenn.) Hospital Medical College, 1902; formerly member of the state legislature; aged 67; died, June 18.

Isidor Besness Goodman ● New York; Medico-Chirurgical College of Philadelphia, 1914; on the staff of the Morrisania Hospital; aged 50; died, June 21.

Howard F. Craig, Protection, Kan.; Eclectic Medical University, Kansas City, Mo., 1911; member of the Kansas Medical Society; aged 55; died, June 11.

Adolph Bernard Lindquest ● Omaha; Omaha Medical College, 1901; served during the World War; aged 64; died, June 4, of coronary thrombosis.

Henry Clinton Stream, Des Moines, Iowa; Kentucky School of Medicine, Louisville, 1897; aged 64; died, June 23, of carcinoma of the esophagus.

David Kenneth Fenwick Mundell, Niagara Falls, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1916; aged 48; died, June 14.

Robert Herman Rowe, Abingdon, Va.; University of Louisville (Ky.) Medical Department, 1912; aged 51; died, June 14, of angina pectoris.

Jacob Hoover Deardorff, Mechanicsburg, Pa.; Hahnemann Medical College of Philadelphia, 1876; formerly county coroner; aged 93; died, June 29.

Enoch C. Haile, Rogersville, Mo.; University Medical College of Kansas City, Mo., 1907; aged 54; died, June 9, of accidental gunshot wounds.

George C. Taylor, Pasadena, Calif.; University of Louisville (Ky.) Medical Department, 1875; aged 87; died, June 10, of cerebral hemorrhage.

Guy Daniel Tibbetts ● Antrim, N. H.; Tufts College Medical School, Boston, 1911; served during the World War; aged 51; died, June 2.

Thomas H. Wilkins, Portsmouth, Va.; University College of Medicine, Richmond, 1900; aged 61; died, June 29, of carcinoma of the pancreas.

Felix G. Smith, Bethany, Mo.; Ensworth Medical College, St. Joseph, 1888; aged 90; died, June 23, in Cherryvale, Kan., of chronic myocarditis.

De Witt Clinton Buck, Eldorado, Okla.; University of Louisville (Ky.) Medical Department, 1893; aged 70; died, July 5, of myocarditis.

Johanna Mena Droppers, Milwaukee; Northwestern University Woman's Medical School, Chicago, 1893; aged 75; died, June 12, of influenza.

Byron L. Perlee, Uehling, Neb.; Omaha Medical College, 1901; aged 78; died, June 2, of carcinoma of the upper part of the abdomen.

Cass A. Bennett, Withamsville, Ohio; Medical College of Ohio, Cincinnati, 1878; aged 91; died, July 8, in a hospital at Middletown.

John David Moulder, Lebanon, Mo.; University Medical College of Kansas City, Mo., 1901; aged 58; died, June 1, of gastro-enteritis.

William H. McDonald, Newsome, Texas; Missouri Medical College, St. Louis, 1899; aged 64; died, June 5, of uremia and pneumonia.

Paul E. Outerbridge, New York; University of Vermont College of Medicine, Burlington, 1884; aged 79; died, June 16, of pneumonia.

Oscar Fleich, Brooklyn; Baltimore Medical College, 1897; member of the Medical Society of the State of New York; died, June 4.

Lee McAdams, Gibsonia, Pa.; Kentucky School of Medicine, Louisville, 1881; aged 88; died, June 9, of cerebral hemorrhage.

Robert Eugene Wilson, Cartersville, Ga.; Atlanta School of Medicine, 1906; aged 72; died, June 2, of cardiovascular renal disease.

Edward Kisel ● Ambridge, Pa.; University of Pittsburgh School of Medicine, 1927; aged 36; died, June 4, of coronary occlusion.

Charles Merrill Rose ● Los Angeles; Syracuse University College of Medicine, 1909; aged 54; died, June 9, of arteriosclerosis.

Enos P. McCormick, Artesia, N. M.; Hospital College of Medicine, Louisville, Ky., 1889; aged 75; died, June 12, of pellagra.

John Stuart Timpany, Digby, N. S., Canada; Detroit College of Medicine, 1893; aged 70; died, June 15, of heart disease.

Lucian E. Maples, Morgan, Texas; Louisville (Ky.) Medical College, 1890; aged 78; died, June 5, of coronary occlusion.

Adam George White ● Lynchburg, Va.; College of Physicians and Surgeons of Chicago, 1890; aged 81; died, June 3.

Bennett Graff, Tulsa, Okla.; Western Pennsylvania Medical College, Pittsburgh, 1901; aged 72; died, June 29.

Bureau of Investigation

TWO FOREIGN MAIL-ORDER FRAUDS

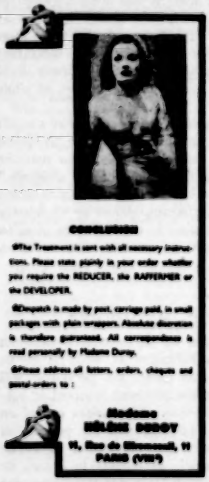
A "Bust Developer" from Paris

For a good many years "Madame Helene Duroy" has advertised an "Exuber Bust Developer" and an "Exuber Bust Raffermer," the last named to strengthen the bust and make it firm. But the astute Helene played both ends of the game and to those who thought they needed it she also sold a treatment for *reducing* the bust.

In some of her circulars sent out in recent years she modestly styled herself a "celebrated Parisian specialist" and confided:

"My own coquetry induced me to study this double problem: a good medical education and a sound knowledge of physiology have shown me the way. Long efforts and researches have brought me success . . .

"Only when, after a short period of treatment, you will have admired in the mirror your bust as it becomes rounder and firmer, only when envy and chagrin will have disappeared, when you see your beautiful bust so much admired, then you will understand the influence that harmonious curves exert on your environment, and you will be glad to have consulted me. . . . I not only specialize in the treatment of beauty, but I am also your counsellor and friend."



Part of the Duroy advertising.

The Post Office Department twice found it necessary to debar "Mme. Duroy's" products from the United States mails by means of fraud orders. The first of these was issued July 29, 1937, and covered both the "Developer" and the "Raffermer." It was then brought out that not only were these devices worthless for the purposes for which they were sold but that they might injure the delicate tissues of the breasts, with serious subsequent possibilities.

In December 1938 the Post Office learned that Helene Duroy was evading the fraud order by using the name M. G. Duhamel. It was found that she had solicited prospective customers in this country by means of a circular in lame English reading as follows:

"Owing to the big success my methods are obtaining in U. S. A., I just created a special Department for my American Clients and beg you to send your enquiries, orders and payments only to the following address: Shipping Dept. M. G. Duhamel, 15 rue de Teheran, PARIS 8 (FRANCE).

"As to your information I beg to add that the most simply and quickest way to forward the remittance would be to send the amount in bank-notes (or cheque) by REGISTERED mail. I would highly advise this kind of remittance as the usually in U. S. A. employed Money Orders take sometimes many weeks before coming to hand in Paris.

"Will you please follow strictly these recommendations as all enquiries, correspondences and ORDERS FROM U. S. A. CAN ONLY BE EXECUTED by my new American Department, via:

"M. G. DUHAMEL, 15 RUE DE TEHERAN, PARIS
8eme. (FRANCE)."

Hon. W. E. Kelly, Acting Solicitor for the Post Office, naturally decreed that "this is a scheme for obtaining money through the United States mails by means of false and fraudulent pretenses, representations and promises and is an evasion of the fraud order of July 29, 1937," and a new fraud order was issued Dec. 14, 1938, to cover the name of M. G. Duhamel of Paris.

A Contraceptive from Berlin

From Berlin, Germany, an individual advertising as Dr. Richard Weiss has for some years been putting out various nostrums for tuberculosis, obesity, diabetes, gout, asthma, catarrh, vaginal infections, urethritis and some other things. His "Pancresal Tablets" for diabetes was declared by the Council on Pharmacy and Chemistry to be unacceptable for New and Nonofficial Remedies in THE JOURNAL, March 27, 1933.

Chiefly, Weiss seems to have played up certain products for sexual weakness and presenility in both sexes. Finally, his advertising of "Amural" for contraceptive use came to the attention of the Post Office Department because the importation of such contraceptive matter is forbidden by statute and its seizure and destruction are authorized at points of entry. Hence, persons remitting money to the promoters of this business would receive nothing in return.

In his memorandum recommending the issuance of a fraud order against the Weiss scheme, Hon. W. E. Kelly, Acting Solicitor for the Post Office Department, pointed out that it is practically impossible to treat effectively by mail patients who suffer from any of the various disorders for which the Weiss nostrums are advertised, and the patients relying on the preparations in question would only grow worse, chiefly through neglect to obtain scientific treatment for their troubles.

Mr. Kelly brought out also that one of Weiss's treatments was for "lost manhood" and he presented scientific evidence that no combination of vitamins or hormones would constitute a proper and effective treatment for all of the many causative factors involved in the condition named. He therefore found the representations for this and other Weiss products to be false and recommended the issuance of a fraud order. It was issued on Oct. 3, 1938.

VARIOUS "SEX" FRAUDS

During 1938 the Post Office Department closed the mails to various frauds of the sexual type. These frauds make their appeal to a class of individuals lacking in ordinary intelligence. Some of them, such as the mechanical-masturbator type of fraud, appeal only to the feebleminded or at least completely unintelligent individuals, while others, including impotence "cures," have a wider, but only slightly higher class, clientele.

For these reasons the Bureau of Investigation is publishing only the briefest outline of Post Office fraud orders of this type which have appeared in the last year or so.

These are named in the following list with the number designation of the fraud order, the date of issuance, the name of the product and its promoters, with its description, and a list of ingredients, if known:

No. 11539, April 5, 1938, "V. V. V."; Eclipse Specialties Co., Glen Rock, N. J.; male sex organ "developer"; cottonseed oil with minute amount of volatile aromatic oil added. A supplemental fraud order (No. 12063) was issued on Aug. 31, 1938, to cover the new names adopted by the same concern, "Honest Home Products Co." and "Eureka Lubricating Cream."

No. 12356, Dec. 8, 1938, "Jay's Kapsule"; Jay Medicine Co., Brooklyn; "sex rejuvenator"; yohimbine hydrochloride, muirapuama and nux vomica extract, with various glandular substances.

No. 12359, Dec. 8, 1938, "Vita-Mon"; Marine Products Co., Los Angeles; "sex rejuvenator," and the like; tablets containing iodine, calcium and magnesium compounds, and starchy materials.

No. 12360, Dec. 8, 1938, "Juvenator"; Barton Sales Agency, Chicago; mechanical masturbator.

Fit to Train Practitioners.—The man who is fit to train the practitioner to begin his lifework must be thoroughly familiar with everything that makes for successful practice, must not only understand disease and its management in its detail, but must be familiar with the science, skilful and precise in the craft, and versatile and diplomatic in the art. But these varied accomplishments will not fit him for the professional chair.—Lewis, Sir Thomas: Research in Medicine and Other Addresses, London, H. K. Lewis & Co., Ltd., 1939.

Correspondence

CHANGE IN MEDIUM FOR SCARLET FEVER TOXIN

To the Editor:—Some persons who have received injections of diphtheria toxoid, especially the alum precipitated toxoid, may be sensitized to proteins contained in veal broth and consequently develop urticaria following injection of other veal broth preparations.

To avoid the development of urticaria in such persons during the course of immunization against scarlet fever, the medium in which scarlet fever toxin is produced has been changed to one which contains no meat infusion. Use of this medium results in a toxin containing considerably less protein and a marked reduction in the incidence of urticaria.

GLADYS H. DICK, M.D., Chicago.

THE ELECTRIC BONE SAW

To the Editor:—A few months ago one of the popular monthly magazines carried an article telling about recent inventions that had been of benefit to humanity and referred to the electric saw as an instrument of present day development.

While there have been some modifications in design by different men during the past thirty years, the electric osteotome was invented and in use in the eighties.

The following description of an electric bone cutter is taken from the *Provincial Medical Journal* of 1889 and is a quotation from the *Electrical Engineer* (London) of Aug. 3, 1888:

> Removal of sections of bone in surgical operations has heretofore been a long, tedious process, effected with a mallett, chisel, gouges, etc. It is, perhaps, the most brutal and unscientific method which could be adopted, and sounds like the operative butchery which existed in the last century. According to the *Electrical Engineer*, August 3rd, 1888, this has all been reformed by an invention called the electric osteotome, which is an instrument holding a circular saw at its extremity, revolved with lightning speed by an electric motor. This, when held against a bone, makes a clean cut through it in a few seconds; in fact, its action is instantaneous. By holding the osteotome in a slanting position, wedge-shaped pieces can be cut out with equal promptitude. There is no danger of the saw cutting the soft parts, as they are protected by a retractor, an instrument which is passed down and under the bone.

The illustration accompanying the article in the *Provincial Medical Journal* showed a small circular saw on a shaft about 6 inches long, in direct line with the small motor.

D. C. PATTERSON, M.D., Bridgeport, Conn.

"THE CHALLENGE OF APPENDICITIS"

To the Editor:—In your editorial "The Challenge of Appendicitis" (THE JOURNAL, May 20), education of the public is stressed as one of the means by which the mortality of acute appendicitis might be reduced. "Education of the public about appendicitis applies to the most important two factors responsible for the increasing mortality, i. e. the increasing use of cathartics for abdominal pain and the delay in the diagnosis and treatment."

Efforts in this direction have been made over a considerable period of time, yet how common it is to find that they have failed of their purpose of warning the patient who falls ill of acute appendicitis. One serious misconception regarding the pain of appendicitis is remarkably prevalent among the public, namely that it is "a pain in the right side." Strangely, the press and the other avenues of public information have never stressed the fact that the pain of acute appendicitis is in the middle of the abdomen. This location of the first (and therefore the therapeutically important) pain is so constant that despite the few exceptions, a pain developing first in an lateral part of the abdomen counts against the diagnosis of acute appendicitis.

How frequently the history includes such statements as "Right away I thought of appendicitis but the pain wasn't on my right side so I knew it couldn't be that"; "I made sure he didn't have any pain on the right side before I gave him the magnesia." Statements such as these are made by persons in all walks of life, including intelligent and well educated individuals. Let any select group, for example engineers, school teachers, business executives or even members of physicians' families, be asked "How would you know if you were stricken with acute appendicitis?" There is great likelihood that the most favored answer would be "I would have a pain in the right side." This simple question merits trial on radio quiz programs.

In contrast to the general complacence toward pain in the middle of the abdomen, so often a symptom of grave import, is the serious concern excited by any right-sided pain. What physician has not had occasion to calm a panicky patient who is terrified with the conviction that he has acute appendicitis and faces operation because he has a pain on the right side of the abdomen, when as a matter of fact the pain is due to some relatively trifling condition readily relieved by simple measures? This common experience is further proof of the firmly fixed popular mistake regarding the predominant symptom of acute appendicitis.

Cases in which life has been needlessly jeopardized as a result of this misconception have often prompted me to state "It should be printed in every newspaper in the United States that the pain in acute appendicitis is in the middle of the abdomen." Such publication, together with widespread dissemination of the same fact by every other possible means, should be confidently expected to effect a greater reduction in the mortality of acute appendicitis than any other single new measure now available.

JOSEPH NASH, M.D., New York.

"PSYCHOSOMATIC MEDICINE"

To the Editor:—If the editorial on psychosomatic medicine (THE JOURNAL, August 5) is indicative of what is to be expected of the journal with that name, the periodical will offer little by way of elucidating the problems involved in correlating the psychic with the physical. This arises out of an incomprehension of the problem at issue and the purpose of restricting the manner by which this correlation is to be effected to the "scientific method." It intends to ignore or disregard the "metaphysical approach." If this is so, then the *Journal of Psychoanalysis* already meets its needs.

Too often concepts are "new" because their authors have not adequately exercised the faculties of retrospection or critical observation. Nor have they perused sufficiently broadly the wealth of learning that is piled on library shelves. "Psychosomatic" indicates mind-body with the implied distinction of "mind" as something other than "body" which is all that is implied by the prefix "meta." Consequently there is no need for newness. It only engenders greater confusion by reason of the arbitrary meaning that must be ascribed to it apart from the connotation it will continue to bear by reason of its association with other words whose meaning is quite clear. There is reason to fear that this revulsion against the old terminology is an expression of escape from all that it connotes. No physician divorced from the paraphernalia of the laboratory or office will deny that there is something involved in human illness which is beyond the physical to explain, which is not mensurable by physical instruments and which is therefore not to be encompassed by the "scientific method."

Far from there being a need of additional journals bearing new titles for older and more comprehensive ideas, there is an imperative need for a reduction in their number. Analytic science has so fragmented the physical aspects of medicine that it is almost impossible to reconstruct an intelligible design from them. Through psychoanalysis not only has this been

attempted with the mind but it has also attempted the translation of psychic or metaphysical activity into physical phenomena. Psychic or mental activity is nonphysical and therefore spiritual. There is no consideration of the spiritual respecting man that does not involve the inclusion of morals or ethics. That is conduct. Whatever need there may be for a journal devoted to correlating metaphysical or psychic activity with biologic phenomena, its purpose would be encompassed by what is understood as pastoral medicine.

JOHN F. QUINLAN, M.D., San Francisco.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

THE VASOMOTOR MECHANISM

To the Editor:—In two articles (Myerson, Abraham: Human Autonomic Pharmacology, *The Journal*, Jan. 8, 1938, p. 101. McNally, W. J.; Stuart, E. A.; Reid, V. F., and McConnell, L. H.: An Experimental Investigation of Tinnitus, *J. Laryng. & Otol.* 51:363 [June] 1936) there has been a tabulation of drugs affecting the vasomotor mechanism. Will you kindly tabulate all the well known drugs including the newer ones that have been shown to cause vasoconstriction and vasodilatation? That is, those drugs which stimulate and depress the sympathetics and also those which stimulate and depress the parasympathetics. Is ergotamine rightly classified as a depressor of the sympathetics. I have been especially interested in this study from the effect on raising or lowering the blood pressure. What is the mechanism of the action of amyl nitrite, phenobarbital, theophylline with ethylenediamine (aminophyllin) and theobromine on blood pressure?

Willard F. Cott, M.D., Washington.

ANSWER.—The caliber of the blood vessels is passively affected by shifts in the distribution of blood and actively controlled by the contractile tissues of the vessel walls. Direct effects on the contractile mechanisms result from chemical agents: metabolic, endocrine and pharmaceutic. Mediated effects involve the (autonomic) nervous system. Although the primary object of the blood flow is to provide for local tissue needs, the regional distribution is determined by the capacity of the body to meet and coordinate all circulatory requirements. The nervous and endocrine regulators of the anatomic units operate under guidance of the controlling mechanisms of the central nervous system. It is not practicable, therefore, to classify, say, a vasoconstrictor drug such as epinephrine without specifying on which vessels and under what circumstances it acts. Typically, this drug causes vasoconstriction by stimulating those elements in the contractile mechanism of the vascular bed which normally respond to nervous impulses, reaching them by way of the thoracolumbar sympathetic system. There are, however, some sympathetic vasodilator fibers whose effects may preponderate, both in particular vessels such as the coronary arteries and in sites such as the kidney, which are normally vasopressor but which show the well known "reversal" after paralyzing doses of ergotoxin. The general rise in blood pressure after an injection of epinephrine is accompanied by a redistribution of the blood, which passively dilates many vessels (especially in the heart, brain and lungs) that have little, if any, vasoconstrictor innervation. The cardiac effects of epinephrine are typically accelerator and augmentor and contribute to the rise in blood pressure and alterations of the distribution of the blood. Frequently there is a (vagal) cardiac slowing during the hypertensive period. This is due to aortic and carotid sinus stimulation of "pressoreceptive" mechanisms (Heymans, C.: *New England J. Med.* 219:147 [Aug. 4] 1938) and the associated controlling reflexes. Sometimes cardiac irregularity ensues and may greatly modify the general and regional picture. The action of the drug may be changed considerably if several drugs are acting simultaneously. It is also often a question of the particular physiologic balance, that is heart rate and blood pressure level, obtaining at the time of administration. An adequate classification should take all these points into consideration.

The active vasodilator mechanisms are partly direct and partly mediated by vasodilator nerves. The anatomy of the latter is ill understood. The minority are parasympathetic in origin. Many run in the true sympathetic. Others, usually described as "antidromic" vasodilators, are associated with somatic afferent nerves; they are the type usually involved in axon reflexes and the action of counterirritant drugs. Nerve-controlled vascular changes in the cutaneous areas are important in the regulation of heat loss, which assists in the control of the body temperature. Passive vasodilatation is secondary to general and remote circulatory changes.

The older terms sympathomimetic and parasympathomimetic as a basis for classification of autonomic drugs are falling into disuse. This is largely because of the recognition of at least four levels at which the autonomic nervous system is subject to pharmaceutic action. Traced from the effector organ, these are (1) terminal, at the neuro-effector junction, (2) internuncial, especially at the outlying ganglions, (3) central, in the controlling "centers" of the central nervous system, (4) reflex, by way of afferent systems, including the specialized "pressoreceptive" (e. g. carotid sinus) and similar mechanisms.

The terms adrenergic and cholinergic (Dale, Henry: Harvey Lectures, 1936-1937, p. 229) are based on the modern view that the transmission of autonomic nerve impulses is mediated by (1) epinephrine-like substances ("sympathins") (Rosenblueth, Arturo: *Physiol. Rev.* 17:514 [Oct.] 1937) in the terminal sympathetic, and (2) acetylcholine-like intermediaries (Loewi, Otto: Harvey Lectures, 1932-1933, p. 218) not only in the terminal parasympathetic (muscarine-like action) but also in the ganglionic transmission (nicotine-like action) of both sympathetic and parasympathetic. A large number of drugs acting at the four functional levels of the autonomic nervous system are reviewed by D. E. Jackson (THE JOURNAL, Feb. 1, 1936, p. 357). A detailed review of parasympathomimetic drugs is given by V. E. Henderson and M. H. Roepke (*Physiol. Rev.* 17:373 [July] 1937). The literature on the sympathomimetic drugs is scattered.

An attempt to classify vasoconstrictor and vasodilator drugs may be made in tabular form under the following heads: I, stimulant (+) or depressant (−); II, active (*A*) or passive (*P*); III, direct (*D*) or mediate (*M*), the latter at the four levels (1) terminal, (2) ganglionic, (3) central, (4) afferent (reflex); IV, adrenergic (*A*) or cholinergic (*C*), whether "muscarine-like" (C_1) or "nicotine-like" (C_2); V, sympathomimetic (*S*) or parasympathomimetic (*P*); VI, regional peculiarities, with regard to active vasoconstriction (*C*), vasodilatation (*D*) or relative inactivity (*I*). A number of examples may be cited:

A. VASOCONSTRICTOR DRUGS

Epinephrine: I +; II *A*; III $M_{1,}$?$_3$ (?*D*); IV *A*; V *S*; VI *C*—mucosae, skin, splanchnic area; *D*—coronaries, ?muscles; *I*—brain, lungs.

Similar (not fully studied): *Kephrine.*

Tyramine: I +; II *A*; III M_1 (?*D*); IV *A*; V *S*; VI *C*—usual.

Ephedrine: I +; II *A*; III *D* (?*M*); IV ?*A*; V ?*S*; VI *C*—usual; effective orally.

Similar (pharmacologically): *Neosynephrine; Amphetamine; Propadrine.*

Ergot (ergotoxine; ergotamine; ergonovine): I ±; II *A*; III M_1 (?*D*); IV *A*±; V *S*±; VI *C*—usual; secondary sympatheticolytic (epinephrine-reversal) action slight with ergonovine.

Cocaine (not procaine): I +; II *A*; III $M_{1,3}$; IV *A*; V *S*; VI *C*—important in local anesthesia.

Nicotine (tobacco smoking): I ±; II *A*; III $M_{2,3}$; IV C_2±; V *S*, *P*; VI *C*—tends to preponderate but effects vary according to (*a*) site of action, (*b*) sympathetic vs. parasympathetic antagonism, (*c*) whether stimulating or paralyzing dose.

Similar: *Lobeline:* central actions predominate, hence uncertainty as to resultant effect on circulation.

Pituitary Gland (pitressin): I +; II *A*; III *D*; IV 0; V 0; VI *C*—capillaries as well as arterioles, including coronaries.

Digitalis: Therapeutically, circulatory changes are secondary to cardiac effects; experimentally, direct vasoconstrictor effects are demonstrable.

B. VASODILATOR DRUGS

"Nitrites" (sodium nitrite; amyl nitrite; spirit of ethyl nitrite; glyceryl trinitrate; erythrol tetranitrate; mannitol hexanitrate): I −; II *A*; III *D*; IV 0; V 0; VI *D*—most vessels, including coronaries, ?excluding pulmonaries.

Histamine: I ±; II *A* (capillaries); P (arteries); III *D*; IV 0; V 0; VI *D*—capillaries, overshadows *C*—arteries.

"Cholines" (acetylcholine; mecholyl and the like): I ±; II *A*; III $M_{1,2}$; IV $C_{1,2}$; V *P*; VI *D*—if cholinergic.

Physostigmine, Prostigmine, Pilocarpine: stimulate parasympathomimetic vasodilators terminally and cause circulatory shifts through their vagal action on the heart. *Atropine* antagonizes terminally.

"Methyl Xanthines" (caffeine; theobromine; theophylline; aminophylline): I — (?+); II *A*; III *D* (?M_0); IV 0; V 0; VI *D*—direct vasodilator action (including coronaries), aided by cardiac stimulation, usually overcomes central vasomotor stimulation.

Alcohol and Volatile Anesthetics: Peripheral vasodilation in cutaneous areas is largely direct; vasomotor center is first stimulated (hence splanchnic vasoconstriction), later depressed; cardiac effects share in the blood shifts and blood pressure changes.

Soporifics (including *Barbiturates*): similar, but larger doses required; some idiosyncrasy of cutaneous vessels in certain individuals.

Blood Pressure: Vascular changes, if sufficiently widespread, modify the blood pressure by determining the peripheral resistance to the blood flow. These changes, however, must be evaluated in relation to (1) the pumping action of the heart, (2) the "effective" volume and physical characters (e. g. viscosity) of the blood, and (3) factors affecting the elasticity of the vessel walls.

MOLES AND THEIR EXCISION

To the Editor:—Six months ago a patient noticed a slight inflammation in a mole located on his left shoulder. He came to me at once and I excised the mole down to the fascia, using local anesthesia and a scalpel. The sutured wound broke open after several days and healing took place by second intention. Silver nitrate was applied several times to exuberant granulations. The specimen was sectioned by a competent pathologist, who pronounced it an entirely benign mole. All went well then until about two weeks ago, when the patient chanced to read something on malignant melanoma. He at once became a cancerophobe and feeds his fear by reading everything he can find on metastases. He now complains of vague pains in the left side of the chest and the axilla. Physical examination and roentgenogram of the chest are negative. What can I tell this man? He quotes me textbooks: 'Moles in this region (the shoulder) if incompletely removed, especially by cautery, are prone to recur in a malignant fashion" and "Metastases may show up as late as three years after removal of the primary growth." Finally, "Local recurrence is unusual, tumor cells spreading from the local lymphatics into the systemic stream." He gives himself up to three years to live and has even made his will. This outlook is ruining his life. What are the actual statistics, if any, on malignant changes in partially excised benign moles? Should moles be excised at all and, if so, how? Finally, is there any specific test for the presence of melanotic metastases in the body?

M.D., Minnesota.

ANSWER.—The fundamental question in this case is the precise nature of the mole that was removed. If microscopic study of the mole by competent pathologists resulted in the diagnosis of a benign lesion and there is neither clinical evidence of local recurrence nor distant metastases, one can assure the patient that his disease is cured and that he has no melanoma.

When a benign mole is excised completely, the question of melanoma does not arise. The best procedure to adopt regarding treatment of moles is to perform careful and complete excision of moles which are so placed as to be subject to irritation and also moles which are showing certain changes, especially growth or increase in pigmentation. There is no specific test for the presence of metastatic foci of melanoma in the body.

LEVULOSURIA

To the Editor:—Is levulosuria treated the same way as ordinary diabetes mellitus? Is it influenced by insulin and does it require a particular diet? My patient is a woman of 21 who eliminates about 12 Gm. of levulose in twenty-four hours.

Judah Minkin, M.D., Bronx, New York.

ANSWER.—In the case mentioned, one assumes that the diagnosis of levulosuria has been definitely established. This is done by demonstrating in the urine the presence of sugar which reduces alkaline copper solutions, is fermentable, gives a positive Selivanoff's test and, with methylphenylhydrazine, yields osazone crystals with a characteristic microscopic appearance and melting point. To prove the absence of diabetes, a formal dextrose tolerance test should be carried out.

Levulose, like pentose, reduces Benedict's solution within ten minutes at temperatures of from 50 to 60 C., although not quite as rapidly or at quite as low a temperature as does pentose.

In contrast to diabetes mellitus, levulosuria is a harmless condition. There is no need for dietary restriction, insulin or other treatment except reassurance.

Levulosuria represents an error of metabolism, probably inborn, in which the rate of removal of levulose from the blood stream is retarded, presumably because of hepatic dysfunction. As judged by other tests, however, the liver function in reported cases has been normal.

LIVE RED ANTS AND ARTHRITIS

To the Editor:—I am enclosing a folder entitled "The Medicinal Value of the Live Red Ant," presented as an address by Dr. William P. Mowry. This was brought to me by a patient with chronic arthritis. Will you please comment on this treatment.

E. T. Morris, M.D., Nashville, Mich.

ANSWER.—The enclosure was titled "Reprint of Address Delivered to the Batavia Grange No. 95, January 1, 1938, by William P. Mowry, M.D., on The Medicinal Value of the Live Red Ant." The reprint is not from a medical journal but is in reality an advertisement. Therein was mentioned the supposed value of "Rufa, the new scientific treatment for rheumatism, arthritis and kindred diseases, the principal ingredient of which is the secretion of the live red ant." Having himself had "arthritis" for several years, which was unrelieved by other measures, Dr. Mowry claims that he "got relief within five hours from the first treatment and never took over five doses." Three other patients then tried the remedy with results which were "astounding" and "miraculous." Presumably similar results were later noted in "case after case." The proponent of this remedy believes that arthritis is due to intestinal toxins, intestinal stasis and impure blood. "Therefore to get results we must change the consistency of the blood stream and at the same time inhibit the growth of bacteria." One is allowed to believe that "Rufa" does just that.

It seems hardly necessary to comment on this. The "remedy" appears to be just one more rheumatism "cure." No shred of scientific evidence is offered to support the claims made. Nothing on the subject has appeared in medical literature. Rheumatism remedies of the past have included horse chestnuts, snake oil, animals' urine and other excreta, and bee venom. To this group can now be added the secretion of the live red ant. There can be no great objection to a trial, on empirical grounds, of such substances. Animal extracts of all sorts have had a perennial fascination for human beings seeking cures. But before such extracts are exploited as effective they must be subjected to the ordinary rules of scientific evidence. Most forms of chronic rheumatism are notoriously variable in their course; they are characterized by frequent remissions and exacerbations and eventually they usually stop spontaneously. The reason so many nostrums can gain a reputation for efficacy is, of course, that they have a psychic effect or that they are used during a natural remission of the disease.

PRESENILE PSYCHOSIS

To the Editor:—Has there been any recent work or publication on vitamin B therapy in presenile psychosis? Since the early symptoms of a presenile psychosis, namely the retrograde amnesia, are also a dominant early feature of pellagra psychosis is it not possible that the former may be related to a condition of avitaminosis? Any references or information extended will be greatly appreciated. What is the nature of the psychosis that may accompany Addison's disease?

M.D., Illinois.

ANSWER.—There has been no recent publication on vitamin B therapy in presenile psychosis (Alzheimer's disease). The following are some recent references on the clinical and physiologic effects of vitamin B_1 deficiency in man:

Peters, R. A.: Physiology and Biochemistry of Vitamin B_1, *Tr. Roy. Soc. Trop. Med. & Hyg.* **31**: 483-492 (March) 1938.
Schretzenmayr, A.: Clinical Aspects of B_1 Avitaminosis, *Klin. Wchnschr.* **16**: 1737 (Dec. 11) 1937.
Goodhart, Robert, and Jolliffe, Norman: Effects of Vitamin B_1 Therapy on Polyneuritis of Alcohol Addicts, THE JOURNAL, Feb. 5, 1938, p. 414.
Cowgill, G. R.: Human Requirements of Vitamin B_1, ibid., Sept. 10, 1938, p. 1009.
Stevens, H.: Avitaminosis B_1, Maze Performance and Certain Aspects of Brain Chemistry, *J. Comp. Psychol.* **24**: 441-458 (Dec.) 1937.
Wortis, S. B.: Metabolism of Brain Tissue: Enzymes and Vitamins in Brain, *Bull. Neurol. Inst. New York* **4**: 588-596 (April) 1936.

Presenile psychosis (Alzheimer's disease) is a progressive cerebral degeneration with the pathologic picture of senility occurring in middle life. The essential neuropathologic lesion is a diffuse degeneration of the cerebral cortex involving all the layers but most marked in the frontal lobes. There is degeneration of the ganglion cells of the cortex, and often one finds a profusion of senile plaques throughout the cortex. The illness develops between the ages of 35 and 55 and the symptoms are essentially those of a progressive dementia with speech disturbance and apraxia. The onset is insidious, and subsequently the patient suffers from loss of memory, habit deterioration, epileptiform seizures, slurring of speech and finally complete disorientation.

Pellagra is characterized by a combination of cutaneous, digestive, nervous and mental symptoms. Neuropathologic studies

show thickening of the meninges, and the brain may be atrophic or edematous. Chromatolysis and pigmentation are found in the ganglion cells of the brain and in the autonomic ganglions. The spinal cord often shows degeneration of the posterior columns. Outside the nervous system one finds cutaneous erythema and atrophic changes in the stomach and intestine. Pellagra usually starts with gastrointestinal symptoms (aggravating the avitaminosis) associated with cutaneous lesions. Nervous and mental changes develop later and are usually in the nature of a depressive state, a delirium or an "organic reaction" with loss of memory, disorientation, confusion and finally dementia.

The presenile psychosis develops in persons who are receiving adequate food and vitamin intake.

The mental symptoms accompanying Addison's disease (adrenal disease) are fatigability, asthenia, headache, insomnia, vertigo, tinnitus, syncope, depression and irritability. In later stages, when the physiologic disturbances are severe, one finds delirium, convulsions, stupor and coma. This condition is best treated by substitution therapy with cortical extract and sodium therapy to replace the loss of sodium from the body.

INTERMITTENT WATERY DISCHARGE FROM UTERUS

To the Editor:—Kindly advise me as to treatment in a case of copious watery discharge from the uterus. The woman, aged 37, is in perfect health otherwise. She was operated on for chronic appendicitis ten years ago. The surgeon told her after the operation that the tubes had been taken out and that she never would be able to have a baby. She actually never has been pregnant. The discharge started a year and a half ago and is growing worse. It is a clear, watery, slightly mucous discharge coming intermittently in big gushes, so that her underwear and bedding are actually wet. The origin of the discharge is the uterus; there is no urinary fistula. The menstruation is normal; bimanual examination is negative and the cervix is normal. An experienced gynecologist examined the patient. He is thinking of an intermittent hydrosalpinx (which he himself has never seen) but apparently the tubes have been taken out! He has also thought of a carcinoma of the tube, but the discharge never has been blood tinged. Thus he also cannot account for the unusual condition. M.D., New York.

ANSWER.—Since bimanual examination has failed to reveal any abnormality, it is advisable to resort to hysterosalpingography. The injection of iodized oil into the uterine cavity will not only reveal the size and shape of the uterine cavity but, if one or both tubes or only parts of them are present and they are patent, will also demonstrate their lumens. Of course, if the tubes are present but closed at the uterine end there will be no evidence of this in the hysterosalpingogram.

If the injection of iodized oil fails to give any information, a dilation and curettement may be performed. If there is a stricture of the cervix, the dilation will overcome it, as may also the dilation of the cervix at the time of the hysterosalpingogram. A stricture of the cervix may be responsible for the intermittent watery discharge, especially if there is a small fibroid in the cervix which acts as a ball valve.

A curettement will reveal whether or not a carcinoma of the corpus is present, because this condition often is the cause of a watery discharge. However, after a year and a half the discharge from cancer would almost certainly be bloody and the patient would not be in good health.

Furthermore, a curettement will demonstrate the possible presence of tuberculosis of the endometrium. No mention is made of the reason for the bilateral salpingectomy, but the patient may have had tuberculous salpingitis. Even if no gross abnormality is revealed by the curettage, this operation might produce a cessation of the discharge. If the hysterosalpingogram and the curettement fail to bring about a cure, an exploratory laparotomy with a hysterectomy may be necessary.

DIATHERMY AND CATARACTS

To the Editor:—A man aged 62 has incipient cataracts. He has purchased a General Electric short wave diathermy apparatus, which he uses for treatment of his sinuses with considerable symptomatic relief. He has asked me whether treatment to the nasal areas will tend to increase the cataract formation. As I have no reference on this, I would appreciate your opinion. M.D., New York.

ANSWER.—As far as is known, the use of short wave diathermy about the head has no influence on the development or progress of opacities of the lens. It is perfectly conceivable that excessive heating of the ocular structures, particularly by deep penetrating heat, could hasten opacification of the lens, but the patient would protest violently against the amount of heat because of the superficial tissue discomfort.

POSITIVE WASSERMANN REACTION IN MAID

To the Editor:—A Negro maid working for a patient of mine submitted to a routine serologic examination. The result was a 4 plus Wassermann reaction (titer 10 plus). She refused to give a history and also refused to submit to a physical examination. She denied knowing of any data of origin (this condition is not hereditary, since the reaction in her family is negative) but admits many sexual contacts. There has been no treatment. I advised the patients to rid themselves of the maid (there is one child in the home) at least until she has received a minimum of treatment. Here is the situation: Several reputable physicians have told my patient that she can keep the maid (not having examined the girl) on the ground that, having a positive Wassermann reaction, she is less dangerous than one whose blood reaction is negative. This seemed stupid to me. However, I would appreciate an answer adequately explaining the possible infectiousness of the maid. Repeated serologic tests have given similar results. A prompt reply would be appreciated, as there has arisen quite a controversy over the question. The real question to answer is Can a maid with definite untreated syphilis be permitted to work in a home without any danger to her contacts, no matter how little?

M.D., New York.

ANSWER.—The fact that the patient's Wassermann reaction is positive, that she is in the active years of life and that she does not have hereditary syphilis would make one suspicious that she is probably in the active stage of the disease. That may be one reason why she has refused a general physical examination. Moreover, she admits many sexual contacts. Of course the advice that a maid who has a routine positive serologic blood reaction is less dangerous than one whose blood reaction is negative is nonsense. Certainly a person with untreated syphilis cannot be permitted to work in a home where there is danger of contacts with other members of the family in various ways, particularly with linen and dishes. The physician should insist on a general physical examination at once.

NEOPRONTOSIL AND CARCINOMA

To the Editor:—I have been using neoprontosil extensively since it appeared on the market in tablet form. Some time ago I heard a pathologist mention the fact that the red dye contained in this drug resembled a dye which he had been experimenting with a year or so ago. The research that he conducted was to find out whether the dye would do any harm to the workers handling it. The results of the research showed that the dye produced cancer of the bladder in practically all dogs to which it was given within a period of from three months to one and a half years. I would be interested in knowing whether any experiments have been conducted with the red dye contained in neoprontosil to exclude the possibility of its being carcinogenic. W. A. H. Schaffer, M.D., Camden, N. J.

ANSWER.—There are no recorded data regarding the possible carcinogenic effects of neoprontosil. However, certain unpublished information indicates that this compound is not carcinogenic in strains of mice which ordinarily are susceptible to chemical agents that produce cancer.

PHOSPHATASE TEST FOR RAW MILK

To the Editor:—It is suspected that bottles of raw milk are being sold in this community as pasteurized milk. Is there any way of determining whether this milk has been pasteurized as labeled? M.D., New York.

ANSWER.—In the laboratories of many large cities a test known as the phosphatase test is used for the purpose of differentiating raw from pasteurized milk. This test is based on the fact that phosphatase, an enzyme, is present in fresh, normal, unpasteurized milk but is completely inactivated by pasteurization.

An article (The Practical Value of the Phosphatase Test in Determining the Efficiency of Pasteurization) by F. W. Gilcreas and W. S. Davis of the New York State Department of Health was published in the thirtieth annual *Proceedings of the International Association of Milk Dealers*, laboratory sections 34-56, 1937.

VARICOSITY ON DORSUM OF PENIS

To the Editor:—A healthy 15 year old boy has a varicose vein on the dorsum of the penis. Is this amenable to injection of a sclerosing solution? If so, please outline the technic and the contraindications, if any. If not, what treatment do you advise? Isadore Shechner, M.D., Newark, N. J.

ANSWER.—A dilated dorsal vein of the penis is not uncommon and need not be treated unless it causes discomfort. Injections are not advisable, as they might produce painful lumps and cause ascending thrombosis. Resection of a small segment with union of the two stumps would produce the most satisfactory collapse and shortening of the varicosity.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, September 9, page 1056.

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: Phoenix, Oct. 3-4. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: *Basic Science.* Little Rock, Oct. 23. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, Nov. 9-10. Sec., Dr. D. L. Owens, Harrison. *Medical (Eclectic).* Little Rock, Nov. 9-10. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written examination.* Sacramento, Oct. 16-19. *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California). San Francisco, Nov. 15. Sec., Dr. Charles R. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: *Endorsement.* Denver, Oct. 3. *Examination.* Denver, Oct. 4-6. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, Oct. 14. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven. *Medical (Regular). Examination.* Hartford, Nov. 14-15. *Endorsement.* Hartford, Nov. 28. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Medical (Homeopathic).* Derby, Nov. 14-15. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: *Examination.* Dover, July 9-11. *Reciprocity.* Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Oct. 23-24. *Medical.* Washington, Nov. 13-14. *Formal* application and supporting data must be received before Oct. 1. Sec., Commission on Licensure, Dr. George C. Rublaud, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 13-14. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, Oct. 10-11. Joint Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, Oct. 9-12. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

IDAHO: Boise, Oct. 3-4. Dir., Bureau of Occupational License, Mr. H. B. Whittlesey, State Capitol Bldg. Boise.

ILLINOIS: Chicago, Oct. 17-19. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: *Basic Science.* Des Moines, Oct. 10. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, State Department of Health, Capitol Bldg., Des Moines.

KANSAS: Topeka, Dec. 12-13. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, Dec. 5-7. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Portland, Nov. 14-15. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St. Portland.

MARYLAND: *Regular.* Baltimore, Dec. 12-15. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 12-13. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 14-16. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Lansing, Oct. 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 3-4. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Oct. 17-19. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: *Reciprocity.* Helena, Oct. 2. *Examination.* Helena, Oct. 3-4. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEBRASKA: *Basic Science.* Lincoln, Oct. 3-4. Dir., Bureau of Examining Boards, Miss Clara Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Written examination and reciprocity with oral examination.* Carson City, Nov. 6. Sec., Dr. John E. Worden, 311 W. Robinson St., Carson City.

NEW JERSEY: Trenton, Oct. 17-18. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 9-10. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 18-21. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: *Reciprocity and Endorsement.* Raleigh, Dec. 11. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 2-3. Sec., Dr. G. M. Williamson, 415 S. Third St., Grand Forks.

OKLAHOMA: *Basic Science.* Oklahoma City, Nov. 6. Sec., of State, Hon. C. C. Childress, State Capitol, Oklahoma City. *Medical.* Oklahoma City, Dec. 13. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science.* Portland, Oct. 28. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia, January. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, Department of Public Instruction, 358 Education Bldg., Harrisburg.

RHODE ISLAND: Providence, Oct. 5-6. Sec., Board of Examiners in Medicine, Dr. Robert M. Lord, 127 Waterman Ave., Providence.

SOUTH CAROLINA: Columbia, Nov. 14. Sec., Dr. A. Earle Boozer, 805 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, Jan. 16-17. Dir., Medical Licensure, Dr. G. J. Van Heuvelen, State Board of Health, Pierre.

TENNESSEE: Memphis, Sept. 27-28. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

TEXAS: Austin, Nov. 20-22. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 13-15. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 13. Sec., Dr. J. W. Preston, 301½ Franklin Road, Roanoke.

WEST VIRGINIA: Fairmont, Nov. 6-8. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: *Basic Science.* Madison, Sept. 23. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical.* Madison, Jan. 9-11. Sec., Dr. Henry J. Gramling, 507 Mariner Tower, Milwaukee.

WYOMING: Cheyenne, October. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

Rhode Island July Examination

Dr. Robert M. Lord, secretary, Board of Examiners in Medicine, reports the oral, written and practical examination held at Providence, July 6-7, 1939. The examination covered fourteen subjects and included fifty questions. An average of 80 per cent was required to pass. Five candidates were examined, all of whom passed. Four physicians were licensed by endorsement after an oral examination. The following schools were represented:

PASSED School	Year Grad.	Per Cent
Tufts College Medical School	(1938)	89.2
University of Buffalo School of Medicine	(1934)	81
Hahnemann Med. College and Hospital of Philadelphia	(1938)	82.4, 82.9
Jefferson Medical College of Philadelphia	(1938)	88.5

LICENSED BY ENDORSEMENT School	Year Grad.	Endorsement of
Yale University School of Medicine	(1937)	N. B. M. Ex.
School of Medicine of the Division of the Biological Sciences	(1933)	N. B. M. Ex.
Tufts College Medical School	(1935)	N. B. M. Ex.
Marquette University School of Medicine	(1938)	N. B. M. Ex.

West Virginia July Report

Dr. Arthur E. McClue, secretary, West Virginia Public Health Council, reports the oral and written examination held at Bluefield, July 5-7, 1939. The examination covered eleven subjects and included 110 questions. An average of 80 per cent was required to pass. Twenty-two candidates were examined, all of whom passed. Twenty-five physicians were licensed by reciprocity and one physician was licensed by endorsement. The following schools were represented:

PASSED School	Year Grad.	Per Cent
Emory University School of Medicine	(1938)	89.6
Northwestern University Medical School	(1939)	83.9, 85.1
Rush Medical College	(1938)	86.2, 87.7
Washington University School of Medicine	(1934)	88.4, (1937) 85.3, 85.3
Duke University School of Medicine	(1933)	82.4, (1937) 84.6
Hahnemann Medical College and Hospital of Philadelphia	(1938)	83.1, 83.8
Jefferson Medical College of Philadelphia	(1938)	90.5
Medical College of the State of South Carolina	(1938)	86.3, 85.1
Medical College of Virginia	(1938)	84.3, 85.9, 86.8, 87.4, 89.6
University of Virginia Department of Medicine	(1936)	86.4
University of Wisconsin Medical School	(1938)	87.8

LICENSED BY RECIPROCITY School	Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1917)	Tennessee, (1938) Arkansas
Emory University School of Medicine	(1936)	Louisiana
University of Georgia School of Medicine	(1937)	Georgia
Rush Medical College	(1937)	Illinois
University of Louisville School of Medicine	(1936), (1938)	Kentucky
University of Maryland School of Medicine and College of Physicians and Surgeons	(1915)	N. Carolina, (1935) Maryland
Tufts College Medical School	(1930)	Ohio
University of Cincinnati College of Medicine	(1938)	Ohio
Western Reserve University School of Med.	(1935), (1937)	Ohio
Jefferson Medical College of Philadelphia	(1924)	Mississippi
Temple University School of Medicine	(1934)	Penna., (1938) Virginia
University of Pennsylvania School of Medicine	(1935)	Penna.
University of Pittsburgh School of Medicine	(1936)	Penna.
Meharry Medical College	(1937)	Tennessee
Medical College of Virginia	(1936)	Wisconsin, (1938, 2) Virginia
University of Virginia Department of Medicine	(1935), (1937), (1938)	Virginia

LICENSED BY ENDORSEMENT School	Year Grad.	Endorsement of
Duke University School of Medicine	(1936)	N. B. M. Ex.

Book Notices

The Patient and the Weather: Volume I, Part 1. The Footprint of Asclepius. By William F. Petersen, M.D. Cloth. Price, $3.75. Pp. 117, with 94 Illustrations. Ann Arbor: Edwards Brothers, Inc., 1935.

With the appearance of this relatively slim printed volume, Petersen's monographic work on the relationship of the weather to disease is both commenced and completed. Reviews of volumes II, III and IV, the latter divided into three parts, and the second half of volume I, have already appeared in these pages, and Petersen's thesis relative to the changes in the capillary bed due to the weather has been summarized so that those who are interested in this phenomenon already have an idea of what he has been driving at. This introductory volume, the only one which is printed—the others were lithoprinted—gives a background of Petersen's extensive study. It discusses to some extent Greek medicine and to a great extent the attitude of Hippocrates toward weather changes with a regard to disease, which can be summed up in the words "All diseases are fundamentally due to interference with oxidation." The remainder of the volume is devoted primarily to a discussion of disease distribution throughout the nation derived chiefly from the reports of physical defects found in drafted men during the war. While the specific correlation of cyclonic changes in this country as related to individual diseases is left to the later volumes, a briefly explanatory presentation is included in this volume I, part I, called "The Changing Restlessness of Winds in America." There is some discussion of what the author calls "racial differentiation," but the matter of race is not highly differentiated and is neglected to some extent in this chapter. Since this is the last volume to appear, it might be well to call attention to the fact that Petersen has now presented a vast amount of material, some of which is highly impressive, and other evidence which seems to be bizarre, to show that changes in cyclonic front and weather conditions and weather zones and other atmospheric changes have a marked influence on illness in this country. The work has been painstakingly done. A great deal of anatomic and pathologic material has been presented, including excellent illustrations. Each disease has been carefully analyzed and specific cases, described in great detail, have been utilized to illustrate the facts presented. While it may be still considered doubtful whether Petersen is justified in the conclusions which he draws relative to the effect of weather on changes of oxidation in the relatively self-contained and automatically biochemically balanced human body, those who are interested in the effect of weather on a specific disease or in this problem as a whole would do well to bear in mind his study if they desire to gain a thorough understanding of any or all of the pathologic processes of mind or body.

The American Criminal: An Anthropological Study. By Earnest Albert Hooton, with the collaboration of the Statistical Laboratory of the Division of Anthropology, Harvard University. Volume I: The Native White Criminal of Native Parentage. Cloth. Price, $10. Pp. 309, with an appendix of 480 pages of tables. Cambridge, Massachusetts: Harvard University Press; London: Oxford University Press, 1939.

For some years Professor Hooton and his students have been making an anthropologic study of criminals. They have been visiting penal institutions in a number of states and have been surveying the inmates from the standpoint of their anthropologic backgrounds with relationship to the specific crimes they have committed. In his earlier semipopular summary "Crime and the Man," Hooton brought out the fact that there are differences between the old American stock, the immigrant of various stocks and the Negro offenders with regard to their criminal behavior. Some of their conclusions agreed with what criminologists have always believed, others have been conflictual. The present report, on the native white criminal of native parentage, is an expansion of part of "Crime and the Man" intended apparently for serious students of the subject having a highly technical anthropologic background. About half of the volume is devoted to discussing general principles and the observations of criminology as the author and others see them, while the other half consists of tables dealing with occupation, size, age and physical characteristics of a particular criminal group, going into such details as thickness of lip integument, hair color and lombrosian characteristics. The general conclusion reached by Hooton with regard to this group of Old Americans is that crime is the result of the impact of environment impinging on an inferior constitution. It is his belief that Lombroso late in the last century brought forth this idea, that Hooton's own observations substantiate him, although Lombroso fallaciously emphasized his stigmas of degeneration, a collection of traits not verified in the present project. He makes a multiplicity of comparisons with regard to age, size and other physical features, and he includes rather superficial sociological factors differentiating, for instance, criminals in various states. He also differentiates criminals in various crime groups although he admits that the grouping of violations according to the type of offense resulting in conviction is erroneous. By implication Hooton admits that his results are probably not of any value in detecting criminals and that there is little in the book to indicate that it will be of much value in correcting criminal tendencies. His idea of inferior individuals is largely on an anthropologic basis: he leaves out of account almost entirely the psychologic factors which are involved in crime. The volume has no direct bearing on psychologic medicine, and while it involves a great deal of painstaking work it is questionable in its practical application. Hooton's theoretical implications must be taken into consideration bit by bit and no general conclusion can be drawn relative to the scientific value of the vast mass of unrelated and related data which form this volume, although one may well question whether the energy expended on this work might not have been more socially profitable if turned into other channels.

Sex and Internal Secretions: A Survey of Recent Research. Editor: Edgar Allen, Associate Editors: Charles H. Danforth and Edward A. Doisy. With Forewords by Robert M. Yerkes. Second edition. Cloth. Price, $12. Pp. 1,346, with illustrations. Baltimore: Williams & Wilkins Company, 1939.

It has been generally considered that the first edition of this book served as an invaluable guide for the student and investigator of the biology and physiology of the sex organs. The various chapters reviewing the progress in these subjects to 1933 were composed by men who were leaders in developing these fields. It was natural therefore that these reviews were ably presented and the numerous experimental facts soundly evaluated.

Since 1933 the rapidity with which data have been reported has led to considerable confusion in the minds of all except those intimately associated with the literature. Many students and physicians have in the past neglected the adequate study of these important subjects because of the uncertain state of the physiologic and endocrine aspects of sex and the belief that current concepts were only temporary and apt to change from day to day. Recently, however, there has been appreciable abatement in the furor of publication, with the more or less conclusive establishment of many of the relatively elementary principles. Unless revolutionary discoveries are uncovered, it appears likely that further developments will be more orderly than those of a few years ago. At the present time much of the chaff has already been separated from the grain. Questionable results have been exposed and considerable early overenthusiasm has been dissipated. Sufficient advance has been made to give our present knowledge a greater stability and future progress a more dependable character. Under these circumstances, physicians should no longer hesitate to undertake an appropriate study of the functions of reproductive organs and their relation to other bodily activities.

The appearance of the second edition is therefore timely. It is needless to say that investigators in the field have been anxiously awaiting its publication. Physicians and students who are not sufficiently acquainted with the literature are fortunate to have available this monumental review, where there can be found the essence of our knowledge presented with much discrimination. The book is naturally an academic presentation, but the physician who is treating functional disturbances of the reproductive organs is urged to search here for the principles on which to base his therapy. It is only in this way that satisfactory progress in the clinic will be accomplished. The modern gynecologist should find this volume indispensable. Much of the material may appear complicated and unnecessary for prac-

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tical purposes, but a satisfactory understanding of the subject necessitates a thorough study of the actual experimental facts from which conclusions have been drawn.

The plan of the book is, in general, quite similar to that of the first edition. There are five sections: (1) biologic basis of sex, (2) physiology of the sex glands, germ cells and accessory organs, (3) biochemistry and assay of gonadal hormones, (4) the hypophysis and gonadotropic hormones of blood and urine in relation to the reproductive system and (5) additional factors in sex functions and endocrine application in man. Many of the chapters, such as those on the biochemistry of sex hormones, have been extensively revised and expanded. Several entirely new chapters have also been added. The authors are mainly those who were responsible for the first edition and were uniformly well selected for their tasks. The Committee for Research in the Problems of Sex, National Research Council, sponsored the publication of this remarkably fine survey.

Encefalitis postsarampionosa en el niño. Por José Bonaba, Director, y Carlos M. Barbero-mme, jefe de clínica. Facultad de medicina de Montevideo (Uruguay), Instituto de clínica pediátrica y puericultura "Dr. Luis Morquio," Colección de monografías. Monografía N.° 3. Paper. Pp. 45, with 9 illustrations. Montevideo: Imprenta "Bongal," de Hilario Bonilla, 1939.

This is monograph 3 from the pediatric clinic of Dr. Luis Marquio in Montevideo. Abstracts and tables are given of twenty-eight cases in children ranging in age from 14 months to 12 years. Most of them have previously been published in South American, French and Italian journals. No publications in English or German are mentioned. Of the twenty-eight cases, six terminated fatally. The gross and microscopic lesions in the brain in one case are described and illustrated. On the sixth day of lobar pneumonia a violent convulsion set in followed by coma. The bilateral Babinski sign was present, the knee reflexes were normal and there was no rigidity. The spinal fluid showed no increase in cells or globulin. Death was twenty-seven hours after the onset of brain symptoms. Infiltrative and degenerative changes were found in the striatum and thalamus (while the substantia nigra escaped). The cortex showed only congestion. In the only other case examined microscopically of which the authors are aware, studied by Lhermitte, the lesions were purely degenerative.

The Startle Pattern. By Carney Landis, Ph.D., Research Associate in Psychology, Psychiatric Institute, New York, and William A. Hunt, Ph.D. With a chapter by Hans Strauss, M.D., Assistant in Psychiatry, Columbia University, New York. Cloth. Price, $2.50. Pp. 168, with 4 illustrations. New York: Farrar & Rinehart, Inc., 1939.

This is a rather extensive report of a simple series of experiments of a type only too seldom seen in this country. The writers begin with the simple startle pattern which has been described so often but primarily studied by Strauss, who contributes two chapters to the volume. The startle pattern is the reaction of an individual to a sudden sound, whereby he blinks his eyes and goes through various contortions. Since contortions have been described in different ways by various reporters, it was thought that careful study of the simple phenomenon would be revealing, as it proved to be. The technic used was to take extremely rapid moving pictures, sometimes reaching two or three thousand exposures per second, and to do this a number of technical details had to be overcome. While the authors did not go into the detailed solution of these problems, it is possible, by reading between the lines, to note the fact that these solutions were achieved. Hundreds of patients were studied. Infants, psychotic individuals, epileptic patients, animals and neurologic cases, as well as the normal, were given a thorough investigation. It is interesting to note that the catatonic schizophrenic, who would be least apt to be expected to act in a startled fashion, were hyperreactive, while other presumably more reactive types of psychoses were slowed down. The hard of hearing patients might again be thought to have a modified startle pattern, but there was only one case in this particular group in which modification was noted. The whole study reveals leads to the psychologist, psychiatrist and neurologist that a simple diagnostic procedure may be devised which would aid in further differentiating pathologic problem cases. The authors did not point out just how this is to be done, although there are some implications. An excellent bibliography is appended.

The Postnatal Development of the Human Cerebral Cortex. By J. LeRoy Conel. Volume I: The Cortex of the Newborn. Cloth. Price, $6. Pp. 114, with 96 plates. Cambridge, Massachusetts: Harvard University Press; London: Oxford University Press, 1939.

This book, which is clearly printed and beautifully illustrated, is a masterpiece of work. The study is being carried out in the Department of Anatomy of the Boston University School of Medicine and the Department of Pathology of the Harvard Medical School in the Children's Hospital and the Infants' Hospital. In the introduction Conel states that the investigation is intended to be a general survey of the postnatal development of the nerve cells in the normal human cerebral cortex. This volume describes the state of development of the neurons in the cerebral cortex of the nine month fetus immediately after birth. All the brains used were obtained from necropsies done within twenty-four hours after death. Great care was used in accepting brains for the study. Six brains were used, four from white male and two from white female infants. Ten per cent formaldehyde was used as a fixing agent. Celloidin and paraffin were employed as embedding material. The methods utilized were staining with cresyl violet, Cajal silver impregnation and the Golgi-Cox and Weigert methods. The average weight of the brains was 335 Gm. The contents of the book consist of chapters on the histology of the lobus frontalis, parietalis, occipitalis, temporalis, insulae and rhinencephalon, as well as a general summary, tables, literature and illustrations. These are unusually well done. There is a surprisingly small bibliography in this special field. The book is highly recommended to all neurologists, neurosurgeons, pediatricians, anatomists and histologists. This contribution will be utilized and referred to frequently.

Biographies of Child Development: The Mental Growth Careers of Eighty-Four Infants and Children. A Ten-Year Study from the Clinic of Child Development at Yale University. Part One. By Arnold Gesell, Ph.D., M.D. Part Two. By Catherine S. Amatruda, M.D., Burton M. Castner, Ph.D., and Helen Thompson, Ph.D. Cloth. Price, $3.75. Pp. 328. New York & London: Paul B. Hoeber, Inc., 1939.

The prediction of growth in childhood, both mental and physical, has been a matter of much conjecture, and many claims have been offered by so-called students of the subject tending to credit or discredit the intelligence quotient as a predictive means and also the value of growth tables. The present volume clarifies the matter to some extent and is highly enlightening as to the fact that there are many elements responsible for normal and atypical growth in both these spheres. Gesell and his colleagues in the Clinic of Child Development at Yale University have been studying these cases for ten years, and the book consists largely of eighty-four short or longer case reports, each designed especially to bring out some feature of development which would be of interest. Some of the cases show clearly how definitely predictive the growth curve or the intelligence test is. Other cases show that, knowing atypical factors such as hypothyroidism, birth injury or some other diagnosable disorder which might interfere with growth, one can partly make a prediction on a basis of the usual normal growth curve. More interesting than this principle, however, are the examples of a large number of cases in which the early development was retarded but, as the result of treatment or for some other reason, the child either assumed the predicted rate or quickly advanced beyond it because of capacity for superior growth, particularly in the mental sphere. Many features such as the influence of physical disease are considered, and parts of the book devote some space to special disabilities such as reading defects and language problems. Immaturity, twinship and foster care are taken up and cases are cited in all the spheres considered, running the gamut from retardation due to some factor which is pointed out to marked natural advancement. While it might be difficult for one who is not fully acquainted with the literature and procedures of child study and child guidance to gain much from a case-study volume of this sort, the whole book presents an excellent argument in favor of careful child study from the standpoint of the pediatrician and psychiatrist and implies that predictions as to spontaneous cure or even the continuation of normal development must be made with some care. On the other hand, hope is given to those who have to deal with problem children in that many are shown not only

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to recover and to reach the normal curve but to advance far beyond the average into the superior range. This book would be valuable for the child psychologist and the physician who has to do with developing children—the pediatrician or the orthopsychiatrist. It is scientifically done and carefully prepared, the cases are well selected and, while some perhaps are too short to show the mechanisms at work, at least they do show the principle involved in the success or failure of the child to develop.

La puberté: Etude clinique et physiopathologique. Par Guy Laroche et al. Paper. Price, 65 francs. Pp. 349, with illustrations. Paris: Masson & Cie, 1938.

This is one of those French symposiums which contain contributions by a number of reporters, some leading in the profession, others relatively unknown, some expert and some inexpert, some with literary ability and some with none. Puberty is considered here largely from a physical standpoint, though there is one chapter devoted to the psychologic problem of puberty. Such physical disorders as glandular changes, cutaneous reactions both normal and pathologic, obesity and sexual changes are discussed in rather satisfactory chapters. There is some discussion of tuberculosis and diseases of the eye, but the whole volume is not so well systematized that every possible disorder of puberty is covered and some are dismissed disproportionately to their significance. A particular example of this is an extensive report on exophthalmic goiter, which is given much more space than the number of hyperthyroid children found in the population would deserve. Since the chief problems of puberty, as recognized in this country, are those of social adjustment and mental development, it is unfortunate that these are not sufficiently recognized in France so that a thorough discussion of them might appear in this volume. The physical disorders, after all, are not as a rule confined to the period of puberty and the discussion of them with regard to this period cannot be strictly held to that relationship. This book has all the weaknesses of a symposium; probably its greatest strength is service to the idea that there are clinicians who would be interested in knowing the special changes and deviations that occur during puberty. These changes and deviations, unfortunately, are not as well dealt with as they should be, for the actual stressing of disease should not overshadow interest in the social and psychiatric problems of the puberal period.

Outline of Psychiatric Case-Study: A Practical Handbook. By Paul William Preu, M.D., Assistant Professor of Psychiatry and Mental Hygiene in the Yale University School of Medicine, New Haven. With foreword by Eugen Kahn, M.D. Cloth. Price, $1.85. Pp. 140. New York: Paul B. Hoeber, Inc., 1939.

This is a small volume intended to give the physician a comprehensive yet practical means of making a psychiatric examination. It is an improvement on the older manuals such as the manual of Cheney and is devised to present primarily an outline which the inexperienced psychiatrist can follow provided he is given guidance, definition of terms and advice about what the various symptoms and signs into which he is looking mean. The construction of this guide is substantially what one would expect; namely, about half of it is devoted to an outline of psychiatric history taking and the other half an outline of the mental examination. The paragraphs are brief, there is much abbreviation, and in a number of places words are inserted in lieu of extended explanations. In such a case it is obvious, of course, that the beginner or the nonpsychiatrically trained person would be obliged to have ancillary information if he wished to use the present volume as a guide. In some places the author shows a lack of knowledge of terminology used outside the field of psychiatry, for in examining mental changes in the visual sphere he uses the term "visual field," which of course applies to campimetry. Errors of this sort are not common in the book, however, and as a whole it can be considered a useful little handbook for the beginner provided he is given training and does not depend entirely on this volume. Most teachers, however, will find that it is more profitable to use their own methods of teaching how to make a psychiatric examination; but in lieu of the teacher's own guide the present volume is the best of its kind that has been produced so far to serve its purpose.

The Stag at Ease: A Cookbook. Being the Culinary Preferences of a Number of Distinguished Male Citizens of the World. Compiled by Marian Squire. Cloth. Price, $2. Pp. 164. Caldwell, Idaho: Caxton Printers, Ltd., 1938.

This is a culinary scrapbook giving the favorite recipes of a number of distinguished male citizens of the world. As with all such collections, the reviewer wonders why every one of these famous people likes something different. Of course they do not. Many of them must prefer corned beef and cabbage. A great many must, as does Louis Bromfield, pick vegetable soup; no doubt this would apply to many another one of the recipes. The book is assembled cleverly and is full of fascinating information. H. L. Mencken likes varied food but at present prefers Chesapeake crabs. Christopher Morley's favorite breakfast is fried apples with Philadelphia scrapple and toasted corn pone. Ogden Nash can eat shad roe and bacon until the shad go home. Ed Sullivan likes Irish stew, and T. S. Stribling likes fried chicken livers. Mark Sullivan says it is "sirloin steak with fried onions, endive salad," and thus the list goes on.

Psychopathic States. By D. K. Henderson, M.D., Professor of Psychiatry, University of Edinburgh, Edinburgh. Cloth. Price, $2. Pp. 178. New York: W. W. Norton & Company, Inc., 1939.

This is a small volume, one of a series of books each containing the annual lectures given in the series dedicated to the memory of Dr. Thomas W. Salmon. The material given here about psychopathic states is not new but it is extremely well presented. The book consists of a short historical introduction containing a discussion of the various components producing conduct disorders, but most of the volume is devoted to a discussion of the clinical manifestations of the psychopath. Henderson divides the psychopathic states into those characterized primarily by, first, aggressive conduct. In this group he discusses suicides and criminal individuals. The second group are those characterized primarily by inadequacy, in which the psychotoids and borderline psychopathic cases are analyzed. Third, Henderson discusses the group of "near genius" conditions. The last chapter treats of social rehabilitation and here the various angles such as psychic immaturity and the influence of fear are taken up briefly, but in it there are discussions of the various steps used in Scotland to deal with the whole problem. In a mild way Henderson advocates assistance on the part of the states toward the rehabilitation of the psychopathic patient, and he feels that mental physicians should not be too much discouraged at their lack of success in treating these conditions at the present time but should remember that the field of therapy is opening widely. There is much brief but interesting case history material; discussion is lucid; and while Henderson calls himself a liberal the present book seems rather conservative to the American mental hygienist in its approach to the subject. It could be perused with interest and satisfaction by the physician who wants a better knowledge of the psychopath.

Your Health Dramatized: Selected Radio Scripts. By W. W. Bauer, B.S., M.D., Director, Bureau of Health Education, American Medical Association, and Leslie Edgley of the National Broadcasting Company. Cloth. Price, $2.25. Pp. 328. New York: E. P. Dutton & Company, Inc., 1939.

The individual physician concerns himself with health education of the public only as far as it affects his immediate practice. More often today than before does he accept the part of health teacher in that he gives generously of his time for addresses before school audiences, parent teacher association groups and various civic societies. The use of the dramatic technic in presenting health information is rarely within his scope. The various county and local medical societies are beginning to look to this form of presenting health information. This volume enables various groups to put on dramatized episodes giving health information. While the original purpose of the book has been to adapt original scripts to meet the need of classroom or assembly, it can well serve as a basis for broadcasts over local stations. The scripts in this volume were adapted from those originally broadcast by the American Medical Association and the National Broadcasting Company in the Your Health series. The Institute for Radio in Education, at its ninth annual session at Ohio State University in 1938, after hearing transcripts of typical programs from the 1937-1938 series, gave the Your Health program a

first award in the health classification. Thirty-two subjects are given and attractive titles are by no means the least in valuable information given. Thus the title "Who Chooses Your Doctor?" will do much to gain the attention of the listening public. A title such as "Hospitals Aid Health" and "The Health Check-Up" will also encourage the casual listener to make sure that he hears that particular program. A title such as "Living With People" is much more attention arresting than would be one on mental hygiene. This is a book that can be enthusiastically recommended to the health educator who wishes to use the newest of all technics at his command.

The Clinical Diagnosis of Swellings. By C. E. Corrigan, B.A., M.D., F.R.C.S., Lecturer in Surgery, University of Manitoba, Winnipeg. Cloth. Price, $4. Pp. 313, with 129 illustrations. Baltimore: William Wood & Company, 1939.

The author states clearly the purpose of this book in the preface, "to present a simple practical method of investigating swellings in order to clarify the problem of their diagnosis." Clinical methods and physical signs form the framework on which the diagnosis of swellings is made. There is consideration of the general diagnosis of swellings, of inflammatory and granulomatous swellings, of tumors, cysts and ulcers, of enlarged lymphatic glands and of swellings of the neck, breast, abdomen, groin, scrotum and about joints. Presentation is excellent and aided greatly by first rate illustrative drawings. This is a unique book and a valuable one, for every practicing physician must be puzzled occasionally about the correct diagnosis when his patient has a "swelling." Most teachers of physical diagnosis, most students and most physicians will find the book valuable and interesting. In these days of modern laboratory diagnosis it is refreshing and heartening to know that intelligent use of the eyes, the ears and the hands can frequently lead to a correct diagnosis which is firmly based on simple physical phenomena.

Pastoral Psychiatry. By John Sutherland Bonnell. With a foreword by Thaddeus Hoyt Ames, M.D. Cloth. Price, $2.50. Pp. 237. New York & London: Harper & Brothers, 1938.

One must be out of sympathy with the minister who passes under false colors. By stressing the Greek derivation of the word psychiatry the author, a pastor, turns psychiatry from a medical specialty to mean merely treatment of the mind, and on perusal of this opus one finds a number of examples of how a nonmedical man goes about correcting personality problems and aiding people. One of the most serious indictments against the ministry as regards its contact with mental cases is the fact that it almost always enhances feelings of guilt—a dangerous process; yet the outcome of the cases as presented in Bonnell's book all seem to be satisfactory, indicating a highly select body of illustrative material. Nevertheless, if the type of advice given by him as shown by some of his examples were given to individuals with deep sexual guilty feelings, serious harm or regression, even to insanity, might frequently result. The book begins by the author's describing his own experiences as a son of an old-fashioned asylum superintendent and worker in a mental institution. He presumes that this could give him insight into mental cases. What he seems to know of psychiatry is distinctly passé. There is no question that a psychiatrist and a minister can work together well in correcting certain types of mental disorders, but knowing Bonnell's ideas on psychiatry, as presented here, a modern psychiatrist might find it hard to consult with him.

The Races of Europe. By Carleton Stevens Coon, Assistant Professor of Anthropology, Harvard University, Boston. Cloth. Price, $7. Pp. 739, with illustrations. New York: Macmillan Company, 1939.

This is a contribution to the science of physical anthropology, tracing the development of man down through the ages and giving the scientific background of the modern European. The book reveals what a welter of mixtures Europe actually represents. Especially interesting is the chapter which indicates that, even though the Jews themselves in Europe constitute a mixture of a variety of types and stocks, they are relatively more pure than any other stock in Europe. For instance, "The racial character of the Spanish, the Germans, of the Poles and of the Russians has changed much more during the last millennium than has that of the Jews."

The Massachusetts General Hospital: Its Development, 1900-1935. By Frederic A. Washburn, M.D. Cloth. Price, $4. Pp. 643, with 13 illustrations. Boston: Houghton Mifflin Company, 1939.

This is the fifth book written on the history of the Massachusetts General Hospital and is aimed at describing the development of the hospital from 1900 to 1935. In a number of the subjects considered, however, the roots go further back than 1900, and where material was found which had not appeared in earlier histories it has sometimes been used here. The history of this hospital is intimately associated with the growth of teaching hospitals in general and with the improvement in medical education and hospital facilities throughout the country. To thousands of individual physicians this history has a more intimate appeal as the institution to which they themselves contributed. This is an excellent source book for information, but the reading is difficult since it constitutes in large measure—perhaps unavoidably—a catalogue of the names of trustees, administrative officers, donors, physicians and physical plant expansion.

The Open Mind: Elmer Ernest Southard, 1876-1920. By Frederick P. Gay. With an introduction by Roscoe Pound. Cloth. Price, $5. Pp. 324, with 13 illustrations. Chicago, Illinois: Normandie House, 1938.

This is a biography of Dr. Elmer Ernest Southard, a pioneer in modern mental hygiene and psychiatry, a public spirited citizen and social worker, and a scientist. The book is written in pleasing style, supplemented by excellent illustrations, anecdotes and comments. There are most interesting examples of Dr. Southard's contributions to poetry and a bibliography of his writings. The book is a valuable contribution to every medical-historical collection and will be of especial interest of course to those in the field of psychiatry.

Comparative Studies Concerning the Strengths of Oestrogenic Substances. By Kaj Pedersen-Bjergaard. Denne Afhandling er af det matematisk-naturvidenskabelige Fakultet antaget til offentlig at forsvares for den filosofiske Doktorgrad, København. Paper. Price, 15 kroner. Pp. 199, with 29 illustrations. Copenhagen: Einar Munksgaard; London: Oxford University Press, 1939.

This monograph is limited to a discussion of the isolation, composition, structure, properties and assay technics of the various estrogenic substances. After a brief outline of the work of the various investigators in this field there is a large section devoted to the author's own investigations. The purpose of the monograph is to compare the activity of the various estrogens under different conditions of administration, i. e. subcutaneous or oral, in oil or water solution, single or multiple injections. These are discussed in great detail, as can be judged by the fact that the author presents twenty-nine charts and 141 tables of his protocols. From a practical point of view this monograph can be summarized rather briefly. There is little here to interest the physician not specializing in this field.

A Short Encyclopaedia for Nurses. By Evelyn C. Pearce, Sister Tutor, The Middlesex Hospital, London. Cloth. Price, $3.50. Pp. 686. New York: E. P. Dutton and Co., 1939.

This short nursing encyclopedia is a cross between a nursing dictionary and a nursing textbook. The material, while abbreviated, covers a wide field and has been selected for practicability. It has been condensed for maximum usefulness. Various diseases, surgical and medical conditions, diagnoses, treatment, diet, abbreviations, apothecary systems and great names have all been included. The more common conditions, such as appendicitis, are naturally given more attention than miners' nystagmus, for which a sentence or two suffices. Timely new drugs, such as sulfanilamide, are discussed. The doses suggested for sulfanilamide would be considered totally inadequate in American hospital practice. Well indexed, this book has a real place on the reference shelf of a hospital library.

The Hippocratic Oath. By Edgar Leon Dittler. Cloth. Price, $2.50. Pp. 310. New York: Liveright Publishing Corporation, 1938.

Even in the mass of medical fiction, nonfiction and essays which have been offered to the public in recent years, this novel by Dittler has a very small place. It brings up the old question of whether or not an intern and a physician can avoid the temptation of sordidness and money and remain true to their ideals. Obviously there are a few who cannot, but the vast majority can. All the old situations of life and love in the hospital are here reflected without much literary quality.

Truth About Cosmetics. By Everett G. McDonough, Ph.D. Cloth. Price, $5. Pp. 311. New York: Drug and Cosmetic Industry, 1937.

In this volume, which is published by the drug and cosmetic industry, the author presents a history of cosmetics and perfumes, a few statements on the subject of cosmetic dermatitis and a general consideration of all sorts of cosmetic preparations. The volume is definitely written for rather than against cosmetics, so that its author is apparently willing to condone the use of metallic salts for removing pigment when the best medical advice is certainly against the uncontrolled use of such preparations. The final chapter deals with treatments for obesity and tries to be as kind as possible to drugs for obesity that are based on bladder wrack without saying at once that all such preparations are pure hokum. The author seems to believe that the use of hypertonic solutions for bathing dries out the body.

Beware Familiar Spirits. By John Mulholland. Cloth. Price, $2.50. Pp. 342, with illustrations. New York & London: Charles Scribner's Sons, Ltd., 1938.

There have been innumerable exposés of the spiritualists. Mr. Mulholland, who has been for many years a student of the subject and who is himself famous as a magician, has investigated the manner in which the spirits are raised. He exposes the inside of the subject. There are still plenty of people who believe that the spirits can be raised, and their notes are also included in this volume. For those interested in keeping up with the latest "dope" on the spirits the book will be found useful and interesting.

Health for 7,500,000 People. Annual Report of the Department of Health, City of New York for 1937 and a Review of Developments from 1934 to 1938. John L. Rice, M.D., Commissioner of Health. Cloth. Pp. 390, with illustrations. New York. [n. d.].

The general death rate in New York in 1937 was 10.4 per thousand of population. The best previous record was 10.3 in 1935; it was 20.6 in 1900. Infant mortality was 135.3 per thousand live births in 1900 and 43.7 in 1937. Maternal mortality fell from 6 per thousand live births in 1933 to 4 in 1937. The department budget, exclusive of capital outlay, was $4,725,817.90 and covered a pay roll of 2,567 employees. "The Department of Health's policy is to urge all who can possibly afford it to use the services of private physicians." There is close cooperation with the three county medical societies, especially in maternal and infant care. "In marked contrast to conditions in this city fifty years ago, and still prevailing in many European countries, modern health administration makes little use of police measures and carries on most of its work through health education."

Textbook of Anatomy and Physiology. By Diana Clifford Kimber, Carolyn E. Gray, A.M., R.N., and Caroline E. Stackpole, A.M., Associate in Biology, Teachers College, Columbia University, New York City. Tenth edition. Cloth. Price, $3. Pp. 643, with 276 illustrations. New York: Macmillan Company, 1938.

The fact that this standard textbook on anatomy and physiology intended for nurses has reached its tenth edition means that the book has been tried and found to be useful, authoritative and readable. The new edition is superior in many ways to the previous editions. The illustrations are excellent. Many of the old illustrations have been redrawn and thirty new ones added. The authors have tried to keep the material abreast of the time by rewriting portions of the text that present new developments and new knowledge. The volume can be heartily recommended as an authoritative, well written, attractively bound textbook.

Diets and Recipes and the Treatment of Diabetes and Obesity. By E. P. Poulton, M.A., D.M., F.R.C.P., Physician to Guy's Hospital, London. Cloth. Price, $2.75; 7s. 6d. Pp. 121. New York & London: Oxford University Press, 1937.

Difficult, indeed, is the task of the physician who must carefully select a diet for the diabetic patient and for those who want to reduce, but here is a book by a physician from Guy's Hospital to help. It provides all the necessary data concerning foods, a number of excellent sample diets and much simple information concerning the routine care of the diabetic and the overweight patient. For those who are really in earnest and willing to study, this is a most useful volume.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Criminal Insanity: Testimony of Alienists Not Conclusive.—In a prosecution for murder the defendant Arridy, who was a ward of a state institution for feebleminded, mentally defective and epileptic persons, pleaded not guilty by reason of insanity. He was committed to the State Hospital at Pueblo, Colo., for observation for a period of thirty days, and a commission of three alienists, physicians at that institution whose professional qualifications and integrity were unquestioned, was appointed to examine his mental condition. The commission reported that in its opinion Arridy was "mentally defective" and that at the time of the alleged commission of the crime he was "incapable of distinguishing between right and wrong, and . . . unable to perform any action with a criminal intent." The state, however, introduced lay testimony to the effect that the defendant was sane at the time that the homicide was committed. The defendant was adjudged sane by a jury and from a judgment convicting him of first degree murder and imposing the death penalty he brought error to the Supreme Court of Colorado.

The testimony of the alienists, said the Supreme Court, was not conclusive as to the defendant's mental condition. The question as to whether or not he was criminally insane was for the jury to decide and it was justified from the evidence in finding that he was "sane at the time of the commission of the alleged offense." In the judgment of the court, the evidence established only that he was weak minded. Accordingly, the judgment of conviction was affirmed.—*Arridy v. People (Colo.), 82 P. (2d) 757.*

Malpractice: Hemostatic Forceps Left in Abdomen.—McGrady was operated on for "stomach ulcers" in 1931. He seemed to have been in normal health for two years thereafter and apparently no effort was made in the course of the trial of the present case to show that hemostatic forceps were left in his abdomen at this first operation. After two years, however, McGrady's stomach began to trouble him. On March 7, 1935, he vomited blood, and one of the defendants, Dr. Brink, was called in. Nine days later another of the defendants, Dr. Lyman, operated for what the reported decision refers to as a "marginal ulcer" of the stomach. The patient made satisfactory improvement for a few days, but on March 20 he suffered a severe pain in the "mid epigastrium." Thereafter he failed rapidly until he died March 22. The undertaker claimed that he found in the abdomen of the deceased a hemostat about 5 inches long "attached to some of the tissue." McGrady's widow, as administratrix of his estate, sued the two physicians who had been in attendance and others for wrongful death. The jury returned a verdict in her favor and the defendants appealed to the Supreme Court of Washington.

While the evidence as to whether or not a hemostat had been found in McGrady's body was conflicting, the Supreme Court regarded the verdict of the jury as determinative of that fact. The defendants did not deny that leaving a hemostat in the patient's abdomen, if one were left there, would constitute negligence, but they contended that the evidence failed to show that such negligence, if there was any, was the proximate cause of death. But, said the Supreme Court, if there was any substantial evidence from which the jury could conclude that a hemostat left in McGrady's abdomen caused the change in his condition that resulted in his death, the verdict of the jury was controlling.

A medical expert called by the plaintiff testified that if a hemostat were left in the abdomen attached to tissue, the tissue would die and deleterious toxins would arise from it; that those toxins would be absorbed into the blood stream; that the hemostat in the abdomen would probably cause pressure on the bowels and thus cause the severe pain suffered by the deceased, and that, in his opinion, the "hemostat would naturally in the ordinary course of events cause death." He subsequently testified that he did not know what was the cause of death. This, in the opinion of the Supreme Court, did not

destroy the effect of his previous testimony, because no one knew what did cause death. Even the defendants and their expert witnesses did not testify that they knew the cause of death.

The defendants and their expert witnesses, speaking generally, attributed death to one of three causes, and the defendants claimed the benefit of the rule that where the evidence goes no farther than to show that death may have resulted from any one of several causes, for one or more of which the defendant is liable and for another or others of which he is not, the jury cannot speculate or conjecture and return a verdict attributing the death to a cause for which the defendant is liable. The plaintiff, however, said the Supreme Court, charged directly that the death resulted from a single cause, namely, the leaving of the hemostat in the abdomen. The rule under which the defendants sought protection, therefore, did not apply. In determining whether the case presented a question for the jury, the defendants' evidence purporting to show that death was the result of one of two or three causes could not be taken into consideration. The weight of that evidence as against the evidence offered by the plaintiff was for the jury to determine, and the jury had a right to find that it was more probable that the change in McGrady's condition and his subsequent death were proximately caused by leaving a hemostat in his abdomen than by any other cause.

The judgment in favor of the plaintiff was affirmed.—*McGrady v. Brink (Wash.), 81 P. (2d) 800.*

Criminal Liability Under Compulsory School Attendance Law of Parent of Unvaccinated Child Excluded from School.—A Pennsylvania statute requires a parent of a child of school age to send the child to school. Another statute requires an unvaccinated child to be excluded from school. The state has no compulsory vaccination law. Marsh was convicted of violating the statute first cited "by rendering his son ineligible for admission to the schools of the state by refusing to have him vaccinated against smallpox" and was sentenced to imprisonment. Claiming that his conviction and imprisonment violated the equal protection and due process clauses of the federal Constitution, he filed a bill in the federal district court, M. D. Pennsylvania, to enjoin the governor and others from enforcing the provisions of the compulsory school attendance law as interpreted by the courts of the state. In the bill of complaint he set out as reasons for refusing to comply with the state law that "vaccination against smallpox may cause loss of life, or health, and that vaccination is not a proper or effective method of preventing smallpox." The defendants, in effect, demurred to the bill of complaint.

The two Pennsylvania statutes, said the district court, have been upheld by the highest courts of the state as a valid exercise of the police power. The superior court of Pennsylvania has sustained the conviction of a parent charged with failing to send his child to school on a showing that the parent in question refused to allow the child to be vaccinated and in consequence rendered the child ineligible for attendance. *Commonwealth v. Butler,* 76 Pa. Super. 113. While a federal district court, said the district court, may under certain circumstances enjoin state officials from enforcing a state statute on the ground that it violates the Constitution of the United States, it has no jurisdiction to restrain state officials from enforcing the penal provisions of state statutes as interpreted and enforced by the highest state courts. The complainant should exhaust the remedies available in the state courts and then appeal to the Supreme Court of the United States if the federal Constitution is involved.

Although it declined to assume jurisdiction, the court cited the case of *Jacobson v. Massachusetts,* 197 U.S. 11, 25 S. Ct. 358, 49 L. Ed. 643, in which the Supreme Court of the United States held that a Massachusetts statute requiring compulsory vaccination was not contrary to the Fourteenth Amendment of the United States Constitution, stating that it was for the legislature and not the courts to determine in the first instance whether vaccination is the best mode for the prevention of smallpox. In the opinion of the district court, the two Pennsylvania statutes involved in this case were within the police power of the state and therefore constitutional.

The complainant's bill was therefore dismissed.—*Marsh v. Earle, Governor, 24 F. Supp. 385.*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Oto-Laryngology, Chicago, Oct. 8-13. Dr. William P. Wherry, 107 South 17th St., Omaha, Executive Secretary.
American Clinical and Climatological Association, Saranac Lake, N. Y., Oct. 9-11. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.
American College of Surgeons, Philadelphia, Oct. 16-20. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.
American Public Health Association, Pittsburgh, Oct. 17-20. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.
American Roentgen Ray Society, Chicago, Sept. 19-22. Dr. Carleton B. Peirce, Royal Victoria Hospital, Montreal, Canada, Secretary.
American Society of Anesthetists, New York, Oct. 12. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
Association of American Medical Colleges, Cincinnati, Oct. 23-25. Dr. Fred C. Zapffe, 3 South Wabash Ave., Chicago, Secretary.
Central Association of Obstetricians and Gynecologists, Kansas City, Mo., Nov. 2-4. Dr. W. P. Mengert, University Hospitals, Iowa City, Secretary.
Central Society for Clinical Research, Chicago, Nov. 3-4. Dr. L. D. Thompson, 4932 Maryland Ave., St. Louis, Secretary.
Clinical Orthopaedic Society, Little Rock, Ark., and Oklahoma City, Oct. 13-14. Dr. H. Earle Conwell, 215 Medical Arts Bldg., Birmingham, Ala., Secretary.
Colorado State Medical Society, Colorado Springs, Oct. 4-7. Mr. Harvey T. Serbian, 537 Republic Bldg., Denver, Executive Secretary.
Delaware, Medical Society of, Wilmington, Oct. 9-11. Dr. John H. Mullin, 601 Delaware Ave., Wilmington, Secretary.
Indiana State Medical Association, Fort Wayne, Oct. 10-12. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.
Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 30-Nov. 3. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.
Michigan State Medical Society, Grand Rapids, Sept. 18-22. Dr. L. Fernald Foster, 311 Cen'er Ave., Bay City, Secretary.
Mississippi Valley Medical Society, Burlington, Iowa, Sept. 27-29. Dr. Harold Swanberg, 310 Maine St., Quincy, Ill., Secretary.
National Society for the Prevention of Blindness, New York, Oct. 26-28. Mr. Lewis H. Carris, 50 West 50th St., New York, General Director.
Nevada State Medical Association, Reno, Sept. 23-23. Dr. Horace J. Brown, 120 North Virginia St., Reno, Secretary.
Pacific Association of Railway Surgeons, San Francisco, Sept. 29-30. Dr. W. T. Cummins, Southern Pacific General Hospital, San Francisco, Secretary.
Pacific Coast Society of Obstetrics and Gynecology, Portland, Ore., Nov. 8-11. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.
Pan Pacific Surgical Association, Honolulu, Sept. 15-28. Dr. F. J. Pinkerton, Young Bldg., Honolulu, Secretary.
Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 3-5. Dr. Walter P. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.
Tri-States Medical Society of Texas, Louisiana and Arkansas, Marshall, Texas, Nov. 8-9. Dr. Robert K. Womack, Longview, Texas, Secretary.
Vermont State Medical Society, Burlington, Oct. 5-6. Dr. Benjamin F. Cook, 134 Bellevue Ave., Rutland, Secretary.
Virginia, Medical Society of, Richmond, Oct. 3-5. Miss Agnes V. Edwards, 1200 East Clay St., Richmond, Secretary.

THE AMERICAN RHEUMATISM ASSOCIATION

Sixth Annual Meeting, held in St. Louis, May 15, 1939

DR. LORING T. SWAIM, Boston, Secretary

(Concluded from page 1066)

The Origin and Nature of Normal Synovial Fluid

DRS. MARIAN W. ROPES and WALTER BAUER, Boston: Many theories concerning the origin of synovial fluid have been proposed, the chief ones being secretion by the synovial membrane, degeneration of membrane rubbed off during motion, dialysis of blood plasma and formation as tissue fluid. No one theory has been generally accepted, however, because knowledge of the characteristics of normal joint fluid has been insufficient to prove the mode of formation. Extensive studies of simultaneously obtained arterial blood and normal joint fluid had been made. It was impossible to carry out such a complete study on the 1 or 2 cc. of fluid obtainable from a normal human joint, so the majority of the studies have been made on fluid from the astragalotibial joint of cattle. Normal human fluid obtained post mortem has been compared whenever possible.

Normal synovial fluid is a clear, pale yellow, viscous, relatively acellular liquid. The cytology varies somewhat in different species. In normal human fluid, which is most important for comparison with pathologic fluids, the average total cell count is 63 cells per cubic millimeter, with a differential count of 69 per cent mononuclear phagocytes, 24 per cent lymphocytes and only 7 per cent polymorphonuclears. The fluid count does not reflect changes in the blood count. Variations in the number of cells and the differential are found normally. That these variations are reactions to daily minor traumas is suggested by the fact that higher counts and higher percentages of phago-

cytes are found in cattle joints that show degenerative cartilage lesions than in the normal cattle joints. Further evidence is found in postmortem human fluids, which show the highest counts in joints with the greatest degenerative changes.

The specific gravity of 1.010 and total solids of 2 per cent correspond with those expected in a dialysate with low protein content. The osmotic pressure studies suggest one of the roles played by mucin in the joint. The observed osmotic pressure of the serum agrees well with the pressure calculated from the albumin and globulin content. In the case of the fluid, however, the pressure calculated from the albumin and globulin is only 57 mm. of water, in contrast to an observed value of 150. Mucin is the only other known colloid and, if the excess osmotic pressure is due to mucin, it is found to exert an osmotic pressure nine times that of albumin—indicating the importance of mucin in regulation of fluid exchange between blood and fluid.

Nonelectrolytes (nonprotein nitrogen, urea and uric acid), which are readily diffusible substances, are found in approximately equal concentration in fluid and plasma, as would be expected in a dialysate of plasma through a membrane permeable to these substances. The concentration of sugar, however, tends to be slightly lower in the fluid than in the plasma, presumably owing to the fact that complete equilibrium never exists in the case of sugar and partly to the rate of utilization. Electrolytes are distributed between plasma and fluid just as they would be between plasma and a dialysate containing the same protein concentration as joint fluid.

The distribution of electrolytes and nonelectrolytes is in accord with the theory that synovial fluid is a dialysate. Perfusion experiments have shown that the anatomic facts are in accord with this theory. The subsynovial blood supply is rich, and in many instances only a few layers of cells are found between the blood vessels and the joint cavity—an ideal arrangement for diffusion.

Formation of synovial fluid by dialysis satisfactorily explains its composition except for the presence of albumin, globulin and mucin. Fibrinogen is absent in normal fluid.

Albumin and globulin are found in normal fluid. The summation of evidence at present indicates that there is slight capillary permeability to proteins in joint fluid. The high albumin-globulin ratio indicates a greater permeability to the smaller molecule, albumin, than to the larger, globulin. The results of animal experiments carried out in our laboratory on the permeability of synovial membrane to proteins are in accord with the protein content in normal fluid.

The concentration of mucin in normal human fluid is approximately 0.8 per cent. It is this mucin which produces most of the viscosity and resulting lubricating value of the fluid. Removal of the mucin reduces the relative viscosity from high values of 50 or more to less than 2. As already indicated, studies of normal fluid suggest that mucin plays a role also in the exchange of water and other substances between blood and fluid. The origin of mucin remains obscure. Our studies to date suggest that it is formed (at least in part) by the connective tissue cells surrounding the joint.

The results of studies of normal fluid to date, therefore, indicate that synovial fluid is a clear, viscous, relatively acellular liquid which is a dialysate of blood plasma to which is added mucin as the fluid diffuses through the connective tissue surrounding the joint. With this information as a basis of comparison, we have already found that detailed analysis of pathologic effusions gives much more diagnostic information than has hitherto been thought possible.

DISCUSSION

DR. J. ALBERT KEY, St. Louis: This is the most careful and complete analysis of synovial fluid that we have had to date. I wonder whether the theory explains the presence in the joint of such small amounts of fluid. There is present in the joint a slightly negative pressure, and the amount of fluid which is present is just sufficient to lubricate the joint surfaces. As to the presence of mucin, I wonder whether any one has been able to obtain mucin from the connective tissues around joints. I know that most of us are familiar with the various attempts to demonstrate the secretory activity on the part of the synovial lining cells. It has been demonstrated from time to time that these cells contain globules of mucin, which are presumably ejected into the joint as occurs in the intestine. I myself have never been able to demonstrate these globules. I have always considered the lining cells of the joints as lamellar connective tissue cells the only modification of which was one depending on the geographic situation and the mechanical forces that are brought to bear on them. It is important that Dr. Ropes and Dr. Bauer should either confirm or put at rest this theory to the effect that these cells are actually secretory cells similar to gland cells.

DR. M. HENRY DAWSON, New York: It is generally recognized that synovial fluid consists of two portions—one which appears to be a filtrate of the blood stream, and the other synovial mucin. It is concerning the nature and origin of this second constituent that there appears to be some difference of opinion. Last month, in association with Dr. Karl Meyer, I reported before the American Society for Clinical Investigation the isolation of an acid-polysaccharide which appeared to be responsible for the characteristic physical properties of synovial fluid. This acid polysaccharide occurs either free or united to protein in salt linkage only. It is our feeling that this constituent is probably elaborated by the lining cells of synovial membrane. Vaubel has shown that mucin is formed in tissue cultures of synovial cells; Kling has demonstrated so-called mucin granules in the lining cells and King has shown the presence of a Golgi apparatus in such cells. With regard to the other portion of synovial fluid, we agree that it is probably a filtrate of the blood stream. However, there is some doubt in our minds whether this can be proved by the methods which have been employed. Similar results have been obtained by studying the electrolytes in saliva and in bile, yet it cannot be stated that these fluids are filtrates of the blood stream. So also the immediate or close proximity of the capillaries and the synovial lining cells offers little evidence in support of the filtrate theory. The capillaries in the choroid plexus and the ciliary body are separated from spinal fluid and vitreous humor by only a single layer of cells, yet these fluids are almost certainly not simple filtrates. However, we do not wish to make too artificial a distinction between a filtrate and a secretion, for in all probability both processes come into play in the formation of synovial fluid.

DR. MARIAN W. ROPES, Boston: I cannot answer Dr. Key's question. Little is known concerning intra-articular pressure under varying conditions and the influence of such changes on the formation of synovial fluid. We have isolated mucin from synovial membrane, connective tissue obtained from the abdominal wall of rabbits, and from mucinous-like pleural adhesions from a patient with rheumatoid arthritis. All these mucins resemble synovial fluid mucin in their physical properties and in being destroyed by an enzyme which we have isolated from B. welchii. We have, as yet, no proof of their chemical identity but we hope to be able to show that these mucins are the same as synovial fluid mucin. We do not think that the chemical identity of any of the mucins has been proved. The exact formation of synovial fluid mucin is unknown. We have never been able to identify with any degree of assurance the mucin globules seen by others in the synovial membrane cells. We believe that the use of the word secretion is a play on words, because, whatever the mechanism of mucin formation is, cell activity is necessary. Whether it is similar to true secretion has never been proved. Surely it is not a glandular type of secretion. The mode of formation of serum proteins and the cells concerned have never been established. The process involved may be similar in the case of mucin. We also have isolated a polysaccharide such as Dr. Dawson has spoken of. The mode of combination with protein is not known. Some of the properties of mucin as it is normally found in synovial fluid resemble those of the compound of the polysaccharide with protein rather than those of the polysaccharide itself. I cannot answer the question about bile and saliva satisfactorily since I do not know the complete composition of electrolytes and nonelectrolytes. Knowledge of the concentration of a few constituents is not sufficient evidence to prove the mode of formation. Spinal fluid, for instance, was thought to be a dialysate until complete analyses had been made. Furthermore, the separation of fluid from plasma by only a few layers of cells is not of itself proof that the synovial fluid is formed by dialysis. Such an anatomic arrangement, however, is compatible with formation by dialysis.

Arthritis Associated with Lymphogranuloma Venereum

DRS. M. H. DAWSON and R. L. BOOTS, New York: During the past three years in the Arthritis Clinic of the Presbyterian Hospital we have observed twenty-four cases of arthritis exhibiting the following characteristics:

1. The arthritis pursues a variable course but it usually appears in a chronic, indolent, serous form showing a marked tendency to relapse. Intermittent hydrops of the joint is not uncommon. Occasionally, acutely swollen, painful and tender joints are observed.

2. The arthritis is usually polyarticular and may involve a variety of joints. It shows a predilection for the knees, ankles and wrists, and frequently the two knees or the two ankles are affected simultaneously.

3. The joint involvement may last for weeks or months, but in no instance is there evidence of bone or cartilage destruction. Except for periarticular swelling and effusion within the joint, x-ray examination fails to reveal any changes.

4. The character of the joint fluid shows considerable variation from case to case but it is never purulent.

5. Cultures of the synovial fluid on all ordinary bacteriologic mediums are sterile.

6. Finally, and most important of all, each case gives a definitely positive Frei reaction and the majority of cases show other evidence of infection with lymphogranuloma venereum.

It is realized that in advancing lymphogranuloma venereum as the causative factor of the arthritis in this group of patients other possible etiologic agents must be carefully ruled out. This has been done by every means at our disposal. In addition we feel that there is sufficient clinical evidence to consider this form of arthritis as a definite entity.

A number of experiments have been done in an effort to demonstrate both the virus and the Frei antigen in the synovial fluid. The results of these experiments are as yet inconclusive. At present therefore we simply wish to call attention to the fact that a rather characteristic form of arthritis is seen in certain cases of lymphogranuloma venereum.

DISCUSSION

DR. WARREN R. RAINEY, St. Louis: Three hundred patients with rectal stricture have been seen in the outpatient clinic at Washington University Medical School. All patients received antisyphilitic treatment until 1935. Throughout this period there was no clinical improvement. The joints chiefly concerned are the knees, wrists and ankles, although one patient has had a constant arthritis of the hip joint. The entire rectum and lower sigmoid of one patient were involved in a tubular stricture, and subsequently a pelvic abscess developed which at operation was found to be an abscess directly connected with the sigmoid. At all times when recurrences of acute symptoms occurred in this patient, the hip joint became acutely painful. In only one patient, that is the patient with arthritis of the hip, has there been any limitation of motion following the acute attack. The joints become slightly swollen and occasionally there is a small amount of fluid present. There is some heat and redness of the skin, but the acute inflammatory reaction as seen in the gonorrheal joint is absent. Aspiration of the fluid from the joint in one case gave a negative culture. It would be interesting to determine whether or not fluid removed from a joint could be properly prepared and used as a Frei antigen. A positive Frei test from such a source at the present time would be important in corroborating the opinion that the arthritis is secondary to the infection of lymphogranuloma venereum. It is difficult to say positively that arthritis is absolutely due to the lymphogranuloma venereum but it certainly is evident that the arthritis is most pronounced during the exacerbations of the colon and rectal manifestations of the disease. Fair responses occurred when the patients received antimony and potassium tartrate intravenously. Particularly the joint symptoms and the abdominal pains were relieved. Since sulfanilamide has been used, the responses to all acute symptoms have been most satisfactory; not only has the proctitis disappeared and the stricture softened, but the painful arthritis has been relieved within one week's treatment. We have not had sufficient time since the use of this drug to determine how long this relief will last but in certain cases there have been no recurrences of the arthritis or rectal symptoms for a period of three months. Nothing characteristic is revealed by the *x*-ray examination, since bone changes are not pronounced. Here again a mild type of osteo-arthritis can hardly be called a secondary manifestation of lymphogranuloma venereum, since most of the patients have had teeth, tonsillar infections and a history of both syphilis and gonorrhea. I am convinced that the arthritis seen during the recurrences of the acute manifestations of lymphogranuloma venereum and the acute period of the inguinal bubo certainly are secondary manifestations of this disease.

DR. CURRIER MCEWEN, New York: At our clinic at Bellevue Hospital in the dermatologic and syphilologic services there were 186 patients in the past four years in whom a diagnosis of lymphogranuloma venereum was made; among these, three were listed as having had arthritic manifestations. The histories revealed the characteristics described by Drs. Dawson and Boots and Dr. Rainey. In one of the four surgical services there have been, in the past three years, fifty-four patients with rectal strictures of the type Dr. Rainey mentioned. Among these there were six patients who had joint manifestations. One of these probably had another form of arthritis but the other five fit in rather well with the picture described by Drs. Dawson and Boots. In two the arthritis was migratory with only mild objective changes; one was mono-articular and mild; two were more chronic, one lasting two months and one six months, but both healed without any residual joint changes, and they presented features described by Drs. Dawson and Boots and Dr. Rainey. Dr. Boris A. Kornblith of the Social Hygiene Division of the New York City Department of Health has recently analyzed 300 cases of lymphogranuloma venereum. He has told me that there were fifteen in which persistent migratory arthritis occurred lasting from one week to two months. Frei antigen was prepared from the joint fluid in one of our cases and was used to test patients known to have lymphogranuloma venereum. The tests were negative, like those of Drs. Dawson and Boots. I should like to ask whether any one knows whether these negative tests have any significance in suggesting that the arthritis is not due to lymphogranuloma venereum.

DR. ISADORE PILOT, Chicago: In 1932 I reported one of the first series of cases of lymphogranuloma venereum from the Cook County Hospital, Chicago. One case was complicated by erythema nodosum. There were definite pink nodules on the extremities, with vague arthritic pains. In that particular case we injected the antigen intradermally and at the same time injected a vaccine of hemolytic streptococcus and tuberculin to see if we could determine the usual causes of erythema nodosum. We obtained a striking reaction, reproducing a typical erythema nodosum nodule with the Frei antigen, with negative results to the hemolytic streptococcus and to the tuberculin. At that time we demonstrated the relationship of erythema nodosum to lymphogranuloma. It is not at all surprising to hear today that there are definite arthritic manifestations in this condition. However, I want to point out the frequency, particularly to those who may study the bacteriology of lymphogranuloma, of the secondary infection with staphylococcus, nonhemolytic streptococcus, and a large group of gram-negative organisms: that these secondary infections may act as a foci of infection and cause arthritic manifestations. There is another source of confusion in the Frei test which, like the tuberculin test, is permanent. The Frei antigen will remain positive for many years after apparent complete healing of the lesions.

DR. WALTER BAUER, Boston: Have the authors tried to make the Frei antigen from synovial membrane? From their description of the synovial fluid I think one could perform a biopsy with little danger of subsequent complications. We do such biopsies on our patients with rheumatoid arthritis and to date have not encountered any serious end results. We have seen only four cases of lymphogranuloma venereum with associated arthritis. They represented cases of acute arthritis coming on shortly after the buboes appeared.

DR. J. ALBERT KEY, St. Louis: It seems to me that the authors have adopted a typical laboratory attitude and left us to assume that they cure all these patients with no difficulty and that the treatment was relatively unimportant. I have seen three that resembled mild rheumatoid arthritis. We tried gold and, as I recall, it seemed to help the lymphogranuloma but did not do much for the arthritis. I wonder how Drs. Dawson and Boots get them well.

DR. M. HENRY DAWSON, New York: The observation which has been reported on erythema nodosum is interesting. I believe that Hellerström was one of the first to point out that erythema nodosum may occur as a manifestation of lymphogranuloma venereum. In regard to the treatment of this form of arthritis I do not think the situation is at all clear. The course of the disease is so variable that it is difficult to evaluate different forms of therapy. Some cases have apparently cleared up spontaneously in the course of a few weeks. Others have pursued a more chronic and intermittent course for months or even years. Some of these cases seem to have been influenced favorably by sulfanilamide and others by the administration of Frei antigen intravenously. However, we do not feel that we are as yet in a position to state which is the best form of therapy or even whether any form of therapy is really effective.

Rheumatoid Arthritis of the Spine

DRS. FRANCES BAKER, JAMES F. RINEHART, STACY R. METTIER and FRED S. BRUCKMAN, San Francisco: We have reviewed the histories of patients with rheumatoid arthritis of the spine seen in the Arthritis Clinic of the University of California Hospital since September 1933. No single etiologic factor takes on importance. Eight patients gave a definite history of rheumatic fever and eight gave histories of definite injuries as the immediate cause of their primary symptoms. Laboratory studies are not particularly helpful. We are impressed again by the fact that rheumatoid spondylitis is largely a disease of males and that the age at which symptoms are noted is frequently between 16 and 20 years. We also found that of the seven patients, or 13.4 per cent, of our series who had a family history of arthritis five had spondylitis before the age of 20 years and six before 25. These facts make us feel that this disease might well be associated with an endocrine nervous disturbance not understood.

The history of one family is worthy of note: Eight paternal aunts and uncles of two patients had "rheumatism" of the spine resulting in crooked backs. The father died of rheumatic heart disease at the age of 40 years. Three sisters died in infancy. One brother had infantile paralysis. Four brothers and one sister developed arthritis.

Observations are presented on a series of patients with rheumatoid spondylitis, pertaining to their vitamin C nutrition and metabolism. The almost uniformly low plasma vitamin C levels and other data indicating significant undersaturation in these patients is considered to show clearly the existence of vitamin C deficiency in this disease. The conviction is expressed on the basis of these and other clinical observations that this deficiency contributes to the onset and continuance of the disease.

DISCUSSION

DR. RALPH H. BOOTS, New York: I do not think there is sufficient evidence to warrant calling this condition "rheumatoid arthritis of the spine," as the title appears on the program. For the present, one of the other terms by which this condition is known is preferable: infectious spondylitis, Marie-Strümpell arthritis or rheumatoid spondylitis. I should like to emphasize three points brought out in this paper. First, the sex incidence. Dr. T. Lloyd Tyson in our clinic at Presbyterian Hospital has recently collected statistics on approximately sixty cases; the sex incidence was four males to one female. I believe that the authors had nine males to one female. This is quite the reverse of the sex incidence in rheumatoid arthritis, in which the disease occurs in one male to approximately three females. Second, the age incidence of onset, which is about ten years younger than that of patients with rheumatoid arthritis. Third, the familial history as shown by the authors. Dr. Tyson found in his series a history of rheumatic fever or rheumatoid arthritis in some member of the family in 50 per cent of the cases. We also found that 6 per cent of the patients had evidence of rheumatic heart disease and 5 per cent had some psoriatic lesion. Did any of the authors' patients exhibit subcutaneous nodules or a high streptococcus agglutination titer, such as is found in rheumatoid arthritis? None of ours did. This work on vitamin C is interesting but it must be admitted today that the etiology of this form of arthritis is still unknown.

DR. J. ALBERT KEY, St. Louis: I object to calling this condition rheumatoid arthritis of the spine. The characteristic feature of rheumatoid arthritis as regards the bone is atrophy. The characteristic of ankylosing spondylitis is the production of new bone; in other words, they are diametrically opposite in their effect on bone. Rheumatoid arthritis is primarily a disease of the synovial tissues with gradual destruction of the joint by invasion of the cartilage by inflammatory tissue. Any one who has ever operated on the hip in one of these cases knows that there may be a mass of bone as big as two fists around the acetabulum. The same is true of the spine. It strikes Dr. Ober and me as amazing that an individual living in California should be deficient in vitamin C. I am glad that the authors stated that it was due to a defect in the patient's metabolism. Patients with scurvy who develop subperiosteal hemorrhages may lay down bone beneath the periosteum when they improve. Now it is not beyond the realm of possibility that patients with ankylosing spondylitis may have intermittent scurvy which would cause hemorrhages beneath the periosteum and after each attack deposit a little more bone with ankylosis as the final result. These joints are ankylosed from without and the joints disappear later.

DR. WILLIAM K. ISHMAEL, Oklahoma City: I find it necessary frequently to testify before the local Labor Commission as regards the role of trauma in relation to the final disability. If there is a rule as to whether trauma is responsible, I should like to know.

DR. FRANK R. OBER, Boston: Do these patients who had a complete cessation of their spondylitis still have a deficiency in vitamin C, and when does the deficiency in vitamin C begin? Does it begin before they have the onset of spondylitis or during the attacks? What is the rate of vitamin C deficiency during the progress of the disease? A young woman who has spondylitis when she increases the vitamin C intake by a glass of orange juice a day gets into trouble with her joints in a few days. What is the relation here? Doesn't overstimulation of vitamin C cause the same symptoms as an underamount of vitamin C?

DR. LORING T. SWAIM, Boston: I have been studying 106 cases of Strümpell-Marie arthritis; twenty-three of the patients were women, about the same proportion that the authors spoke of. I also have a family that I have been watching in which the father, two sons and a daughter have Strümpell-Marie arthritis. I agree with Dr. Key that it does not seem like true rheumatoid arthritis in some cases. We have had autopsies in a few cases and the intervertebral disks are apparently perfectly intact, with ossification of the intervertebral ligaments and fusion of the articular facets. In my studies of vitamin C, deficiency is about the same as I find in rheumatoid cases. I do not feel that there was any more deficiency in vitamin C than in people comparably sick with rheumatoid arthritis.

DR. CURRIER MCEWEN, New York: I should like to ask what the authors find the vitamin C levels to be in patients with debilitating diseases other than rheumatoid arthritis and spondylitis.

DR. M. HENRY DAWSON, New York: I have always been under the impression that the primary lesion in rheumatoid spondylitis was a synovitis of the posterior intervertebral joints and that the longitudinal ligaments and intervertebral disks were not involved until the later stages of the disease. I have always felt that the pathology of this condition was essentially the same as in rheumatoid arthritis of the extremities. According to ideas which have been expressed here today there seems to be some difference of opinion in this matter. If there are significant differences, I think it is time that they were adequately described.

DR. WALTER BAUER, Boston: I wish to agree with Dr. Dawson. The pathology of rheumatoid arthritis is the same whether it involves the spine or the peripheral joints. This is well shown in cases with associated hip joint involvement. I do not believe that vitamin C deficiency plays a major etiologic role in rheumatoid spondylitis. One might similarly argue that the deficiency of hemoglobin, serum proteins and serum cholesterol seen in patients with rheumatoid arthritis is also of etiologic significance. One should be extremely cautious in judging the effect of therapy in rheumatoid spondylitis. Certainly a period of two to three months is far too short a time to enable one to say that a patient with rheumatoid spondylitis has been benefited by the therapy employed.

Dr. J. A. Key, St. Louis: These patients have synovitis in the intervertebral joints but they get ankylosis by ossification of the joint capsule and ligaments. Bone grows out from the attachments around the joints and then the two bones gradually fuse.

Dr. Robert B. Osgood, Boston: One does not always get calcification of the sacro-iliac joints. I have had a case under observation for eight years and the sacro-iliac joints are perfectly free; so it does not always start in the sacro-iliac joints.

Dr. Currier McEwen, New York: I believe that the information regarding the identity of pathologic changes in rheumatoid arthritis and the type of spondylitis we are discussing is too indefinite at present to warrant a final assumption that the entities are the same. On a clinical basis there are a number of such striking differences between the two that one must at least suspect they are different diseases. There is a striking difference in incidence between the two sexes. The serum of patients with rheumatoid arthritis agglutinates hemolytic streptococci in the great majority of cases, whereas that of patients with spondylitis ankylopoietica never does. Furthermore, in my limited experience with spondylitis, the patients having it have seldom had involvement of peripheral joints (other than the hips and shoulders) and in the few patients with involvement of other joints the changes have not been characteristic of rheumatoid arthritis. I am convinced that, if there is any doubt of spondylitis ankylopoietica being rheumatoid arthritis of the spine, it should be listed as a separate entity with the mental reservation of course that it may well be merely a form of rheumatoid arthritis. I do not see how considering the two identical as long as there is any reasonable doubt can add to scientific advancement; rather it adds to confusion and delays a satisfactory classification of these diseases.

Dr. Walter Bauer, Boston: In the thirty cases of rheumatoid spondylitis that we encountered in our first 300 patients with rheumatoid arthritis there were seventeen that had peripheral joint involvement. Some of these patients had multiple joint involvement. In only three cases was the disease confined to the spine alone. The remaining cases had involvement of the spine and shoulders or hips. I have never seen a rheumatoid arthritic nodule in a patient with a true rheumatoid spondylitis unless he had peripheral joint involvement. Hench presents an illustration of one such case in his Nelson's Loose Leaf Surgery article. If we could occasionally demonstrate true rheumatoid arthritic nodules in cases of rheumatoid spondylitis without peripheral joint involvement, we would then be in an even better position to argue that rheumatoid spondylitis and the peripheral type of rheumatoid arthritis are one and the same disease.

Dr. James F. Rinehart, San Francisco: One can see shadows of increased density reaching between the vertebral bodies which represent calcification and possibly ossification of the ligaments. The vertebral bodies themselves, however, are demineralized and show no hypertrophic spurring. Many patients in this group have peripheral joint involvement at some time during the course of their illness, just as Dr. Bauer found in his series of cases. I agree with him that this is perhaps the strongest evidence that this type of spondylitis is fundamentally similar to the other forms of rheumatoid arthritis. It has already been pointed out that this is a proliferative synovitis in the small joints of the spine. Dr. McEwen has asked about the vitamin C levels in other debilitating diseases. I would emphasize the consistency of data presented here. Over 90 per cent of these afebrile patients with rheumatoid spondylitis had a severely lowered vitamin C concentration in the blood. We have studied quite a series of chronic infections unassociated with arthritis which have not been analyzed for this report. We found the values lowered in approximately 40 per cent of such cases, but they have not shown the uniformly and strikingly low levels seen in rheumatoid arthritis. I do believe that Dr. Boots seriously objects to the terminology. I can see no distinction in the terms "rheumatoid arthritis of the spine" and "rheumatoid spondylitis," which is the designation used by Dr. Boots's associate, Dr. Dawson. Dr. Ober asked if the deficiency in vitamin C exists before or after the onset of the disease. Naturally I cannot directly answer this question because we do not see patients before the onset of the arthritis. On the other hand, we have gone into the dietary history in cases studied and find that many have been taking less than 10 mg. of vitamin C a day. The normal human requirement is estimated at approximately 50 mg. daily. If these patients take only 10 mg. a day, it would not be unusual if they suffered some degree of vitamin C deficiency after a period of years. Furthermore, we have also indicated that certain of these patients show faults in absorption or utilization of vitamin C which would further contribute to the deficiency.

Treatment of Chronic Arthritis: Results with Saline Injections Used as Controls for Vaccine Therapy

Drs. Nathan Sidel and Maurice Abrams, Boston: This article is to be published in full in The Journal.

DISCUSSION

Dr. Russell L. Cecil, New York: Ten or fifteen years ago, vaccine therapy was widely used in arthritis clinics and was considered a valuable form of therapy. At present it seems to be on the wane and we are now in the era of gold therapy. I wonder what gold therapy will look like fifteen years from now. We must attempt to maintain an even keel and try to evaluate our therapy as we go along and not be carried too far one way or the other. The authors quoted me as saying that the majority of patients are benefited by vaccine, and that seems to have been their experience also. There is a great deal of difference, however, between benefit and cure. If we could cure 75 per cent of our cases with either vaccines or saline solution we would have a fine record. The trouble is that these therapies seem to help the patient temporarily but do not lead to real, permanent cures. When I see a rheumatoid patient cured with vaccine I wonder if my original diagnosis was correct. Our criteria for the diagnosis of rheumatoid arthritis should be more clearly defined. Certainly we should not put all cases which we cannot classify into this group. The rationale of vaccine therapy has not been settled any more than the rationale of gold therapy. I do think that foreign protein therapy has a place in the treatment of arthritis. I would just as soon give streptococcus vaccine as boiled milk or some other form of protein. So far as I have been able to observe, if streptococcus vaccine is given intravenously the immunizing effect seems to be practically nil and whatever effect there is must be a nonspecific one. One sees strange things happen in the therapy of osteo-arthritis. It is considered quite unorthodox to use vaccine in osteo-arthritis; but when I do not know what else to do for this condition, I am occasionally guilty of using vaccine in osteo-arthritis and, strangely enough, it sometimes does help. I think here we are probably dealing with a psychotherapeutic reaction. As for any rationale for vaccine treatment, I think we have always been on thin ice and probably will continue to be there.

Dr. R. H. Freyberg, Ann Arbor, Mich.: I have had relatively little experience with the use of vaccines, but to date I have not been impressed with their value as I have employed them. About a year and a half ago I visited many clinics and laboratories engaged in the study of arthritis. I made it a point to inquire at each place whether or not vaccine was used or advocated. From eleven such inquiries I learned that four used vaccines commonly and considered them valuable. Three of these four had developed different vaccines in their own laboratories. The manner of their use differed considerably. One of these four treated all types of chronic arthritis with a streptococcus vaccine. The other three treated only rheumatoid arthritis. Those who considered vaccines valuable were not sure how they acted to accomplish the benefit. Six other clinic heads had given up the use of vaccine after clinical trial, considering it valueless or of possible benefit only rarely. One other did not advocate vaccine therapy chiefly because he considered it on an unsound basis. This survey shows how different is the opinion concerning the value of vaccine therapy among our contemporaries. Certainly one must consider that streptococci play an important role in the etiology of arthritis if one considers streptococcus vaccine to be of direct therapeutic value. Moreover, one must believe that the administration of vaccine in some way aids the body in combating streptococcic infection or the abnormalities at the joint which in some way are thought to result from this infection. Objective proof that either of

these premises is true is to my knowledge lacking. If vaccine is used, should it be autogenous or stock vaccine, polyvalent, mixed; should it be injected intradermally, subcutaneously or intravenously; should small or large doses be used? If vaccine therapy is beneficial, does it act to increase specific immunity, desensitize or benefit in a nonspecific or indirect way? These are questions still not satisfactorily answered for me and answer for which must necessarily await elucidation of the cause of arthritis and a better understanding of at least immune response. An evaluation on the basis of clinical test requires careful control studies. Measuring change in the arthritic process is not as easy as measuring changes in blood following therapy for anemia, for instance. In considering clinical evaluation of the effect of vaccine, Drs. Sidel and Abrams have clearly shown how deceiving can be the apparent response to injected medications. In support of their study, I wish to mention a similar investigation by Drs. Dreyer, Singer and Pilot, noted in abstract in a recent program of the Central Society for Clinical Research, which indicates that "when normal sodium chloride was substituted for vaccine in a group of twenty cases of atrophic and fifteen of hypertrophic arthritis, all of whom had been responding favorably to the vaccine, there was no change in favorable response. Also a group of patients not previously treated with vaccine showed clinical improvement when saline injections were given without previous vaccine administration." They concluded that "hypodermic normal salt solution was as effective in the treatment of chronic arthritis as like quantities of a streptococcus vaccine." That the injection of medication can have a strong psychic effect cannot be doubted. The authors' investigation has extended over a sufficiently long time and includes a large enough group of cases to make the results surely significant. It clearly shows that it may be not the medication that is injected but the injection itself, with the opportunity therewith for the institution of other factors of treatment, that produce results which may often have been erroneously attributed to vaccine.

DR. IRVING DREYER, Chicago: Four years ago my associates and I commenced a study along the lines of the one just reported in a similar group of patients and with similar results. Our procedure was somewhat varied in that we tried to control treatment more intensively. In the first place we used vaccines that were giving a definite response; these were prepared from a definitely known and well studied bacterium—Streptococcus haemolyticus Davis—for which we had extensive bacteriologic data. This was a monovalent vaccine and the Crowe minimal dose method was used with subcutaneous injection. In patients who were getting streptococcus vaccine and in whom without notice we switched to saline solution we saw no change in the beneficial response in those who were responding favorably. In the group of patients who were not getting vaccine in whom we administered the saline solution the response given was about the same as in those who had been switched from vaccine to saline solution. Another method of control was to continue treatment for at least six months in order to eliminate meteorological effects. We observed some patients for four years. We tried omitting the saline solution in a few cases. In these cases aspiration of a few minims of air from an empty vaccine vial gave the patients no opportunity to notice a change in our procedure. We noted no change in our patients who were responding beneficially prior with vaccine. Finally the technic —subcutaneous injection—was identical in the vaccine and saline groups. One other point is the type of patient. Usually these were dispensary patients. However, to convince myself I introduced a little saline therapy among private patients who were responding well to vaccine. They too noted no difference. Among the problems that are brought up by this sort of study, the first and most important is this: Are the results of vaccine therapy to be explained solely on a psychologic basis? If so, may we use the term suggestion instead of psychic? And if so, who is being suggested, the patient or the doctor? Pavlov has shown that by repeated association with a secondary stimulation an organism can be conditioned against a certain type of response. Are we conditioning our patients to a favorable response by giving hypodermic injections to a group of individuals susceptible to mass suggestion? Next, are we altering the reactivity of the patient's cellular structure when we use vaccine and so desensitize him? If this is true then the reported results with saline solution will have to be taken into consideration. Vaccine therapy has been reputed by some to be a form of immunization. This theory will have to be evaluated in the light of this investigation. Finally, is it possible that the mere prick of a needle will be sufficient to stimulate a beneficial response? Reports by Petersen and Levinson, by Reese and by Mueller indicate that minimal nonspecific stimulation to the skin can so disturb the balance of the autonomic nervous system that as a result changes in the distribution of the white blood cells, in the leukocyte partition and in the chemical constituents of the blood can occur. That profound autonomic disturbance can occur in sensitive individuals from puncturing the skin and subcutaneous tissues is common knowledge and is illustrated by the shock accompanying aspiration of a joint or by the introduction of a needle into the pleural space.

DR. K. K. SHERWOOD, Seattle: I have been using saline injections in arthritis for four years and appreciate the great difficulties that are encountered. I have used intravenous injections. From a laboratory standpoint I have determined that there is no shift in the Arneth count of the leukocytes following saline solution. The things I have learned in these four years are two: first that atrophic arthritis and hypertrophic arthritis are not uniform syndromes; in other words, in order to evaluate vaccine therapy it seems to me we have to subdivide our grouping further. There are some types of cases, such as spondylitis, which do not tend to improve under any therapy. There are other types which improve regardless of what is done. The second point which makes the control series difficult is the treatment of complications. These patients may be suffering from pyelitis, may have menopausal disease, may have constipation or obesity, and it is difficult to keep the patient from self medication or to withhold symptomatic medication, all of which may influence the results.

DR. FRANCIS J. SCULLY, Hot Springs, Ark.: I should like to ask the authors whether in giving the vaccine intravenously they had shock reactions or whether they gave it according to the method of Dr. Cecil without getting shock reaction. At the time at which foreign protein injections were first used I was associated with Dr. Joseph L. Miller and observed many cases of shock reaction. I have not used vaccines for this purpose in chronic arthritis since then, as the results observed were not good. I have used vaccines in selected cases of rheumatoid arthritis, giving it in the dose recommended by Dr. Cecil. I have not used it in osteo-arthritis. I gave it for its desensitizing value rather than for its immunizing value. There is no doubt of the psychologic value of any injection. If one did not get any more than just the psychologic effect to help keep up the patient's morale it is certainly of advantage to those suffering from chronic arthritis. I believe one is justified in using vaccines or other injections until a remission can occur or until other therapy such as baths and medication can have an effect. If one is going to give something as an injection I believe the vaccines would be better than the simple saline solution, as it would have the desensitizing value at least. The report of Drs. Sidel and Abrams of 84 per cent improvement with saline solution certainly seems better than the results we get in Hot Springs with the baths.

DR. L. MAXWELL LOCKIE, Buffalo: I should like to ask how the group of arthritic patients are coming along who receive no form of injection treatment.

DR. EPHRAIM GOLDFAIN, Oklahoma City: I began to use a combination of mixed polyvalent and autogenous bacterin. At the beginning, even though I used small doses, rather serious effects were produced in some of my cases, because even with the small doses they would get sustained and lasting adverse reactions that often caused a relapse in their joint symptoms and greater disability over a long period of time. Eventually I found that it was necessary to treat arthritic cases, especially the chronic infectious polyarthritis and atrophic type of arthritis, by means of doses of vaccine which are suited for the individual and are of such quantity as will cause a desensitization on the part of the patient toward the bacterin rather than the production of immunity. After adequate desensitization had been established, gradually increased dosage was possible in many cases. Vaccine therapy is a dangerous weapon. Its dosage must be adjusted to each individual. It must be used on a basis

of desensitization and not on a basis of establishing a solid immunity. In the bacterin treatment of chronic infectious arthritis or atrophic arthritis one should be careful that the amount of antigen introduced is so regulated that an unfavorable reaction will not occur when the antigen combines with the involved joint tissues, as it must in due time. I feel, therefore, that it is necessary for us to know whether these principles in respect to vaccine therapy of arthritis were observed in the cases quoted before this work and its stated results can be accepted.

DR. NATHAN SIDEL, Boston: I am interested in the figure of four years that has been mentioned by some. It is quite a coincidence. As to Dr. Dreyer's discussion as to why saline solution is of value, all the questions he has raised have been considered but I think they are speculative. I cannot add anything to them. As to Dr. Scully's comment on the reaction in two of his patients, there were no reactions with large doses in our patients. We followed the plan of Dr. Cecil and have not had a single reaction. The dose was worked up gradually. In answer to Dr. Lockie's question about those who did not have saline solution and how they got along, we have quite a number who did not get injections and they begged for them. We try to keep one group without injections, but they see so many others getting injections with beneficial results that they want injections. Dr. Goldfain mentioned using vaccines for desensitization. In view of our experience, I cannot see why vaccine should be used at all except as an adjunct to other therapy. If a patient is told to follow a certain program of therapy and certain hygienic measures, even the most intelligent will not do it unless something tangible is done. If a vaccine is given, I suppose that helps because the patient is under frequent observation and thus made to toe the mark a little bit more.

The Prevention of Arthritic Deformities by Early Orthopedic Management

DR. JOHN P. STUMP, New York: Operating on crippled arthritic patients makes the orthopedic surgeon keenly appreciate the necessity of preventing deformities and preserving normal structure and function of joints early in the disease. This desirable result can be obtained only if patients realize the necessity of prolonged, planned treatment and internists and orthopedists cooperate from the onset of arthritis until the patient is returned to useful activity.

Early orthopedic management corrects faulty body mechanics, saving patients the fatigue caused by unnecessary muscle strain. Correct alinement avoids stress on joint structures and renders them less vulnerable to advancement of arthritic processes.

Painful joints are relieved by rest in circular casts. Immobilization encourages subsidence of inflammation in joints and hastens return of complete motion. Immobilization should not exceed one week and must be vigilantly supervised.

Because arthritic patients rest long periods, firm beds are essential to prevent body distortions and soft tissue strain. A "cradle" prevents bedclothes from holding extremities in the flexed positions assumed during relaxation. Normal body relations should be maintained by correct, adequate splintage.

Following the acute stage, massage and active motion will encourage muscle development and joint motion. Ambulatory patients should have braces for joints incapable of self support. With weight bearing, arthritic patients are especially susceptible to distortions, and repeated orthopedic examinations are indispensable.

DISCUSSION

DR. K. K. SHERWOOD, Seattle: This paper emphasizes the fact that correct management of the arthritic patient involves not only the control of his pain and toxemia but also the prevention of his deformities. I am sorry that Dr. Stump has not laid more emphasis on the differentiation between the two different types of arthritis. Obviously the hypertrophic arthritic joint can be treated much more liberally than the atrophic. In atrophic arthritis of the slow progressive type, flexion deformity should be regarded as the natural outcome of the disease. In hypertrophic arthritis it usually appears only after gross neglect of the traumatic factors involved in the syndrome. I wish to modify Dr. Stump's statement about the dangers of the most comfortable position. The most comfortable position is the one in which greatest support is given the joint. With the use of home appliances, such as pillows, partial flexion of the joint is a usual necessity in order to obtain support at the side of the joint. With casts, braces, and so on, the same support both longitudinal and lateral can be given in positions other than partial flexion. Thus, the development of deformities in arthritis is not simply a matter of incorrect application of support but more frequently of the incorrect type of support. Naturally, if proper support is correctly applied, no deformity will result. I wish to reemphasize the value of passive motion with rest in casts in the treatment of acutely involved joints. By this method, not only do we apply the correct support to the afflicted joint but ordinary nursing personnel can give passive motion at frequent intervals, thereby not only preventing ankylosis but hastening recovery. Finally, I have a question to ask Dr. Stump. I have found no satisfactory method of treating the subluxations of the fingers after they have occurred in atrophic arthritis. I should like to ask him what type of apparatus or plan of procedure he has found most satisfactory.

DR. EDWARD F. HARTUNG, New York: From my observation of the frequency with which deformities in arthritis are allowed to develop, these basic principles of prevention cannot be reiterated too frequently. Two important sidelights to this paper should be emphasized. If, as the recent U. S. Public Health Service Survey suggests, there are six million people today totally disabled because of rheumatism, it is obvious this large group of patients is mostly in the hands of the family doctor. My own observation is that our present medical school education gives scant attention to instruction in the fundamentals of medical orthopedics. Until this situation is changed and medical men know and care more about body mechanics, we shall continue to have a high incidence of deformities due to arthritis. My other thought is that such meticulous care to prevent deformities is usually not possible except in a hospital. As has been asked time and time again, where are the hospital beds for these patients, as well as for those of later stages who need orthopedic rehabilitation? These procedures may take from three months to two years or more. We have heard enough about the almost total lack of these facilities; now at last we may have action. Let us hope that the committee which Dr. Pemberton, I believe, is heading will produce a feasible plan quickly. With government agencies becoming increasingly more interested in this problem, we must not be found lacking a program.

DR. ROBERT B. OSGOOD, Boston: It is much easier to prevent than to cure these deformities. I have always maintained that arthritis is a medical disease. I have been waiting to have the medical man turn out to be an orthopedist. I do not see why an orthopedic man cannot take a medical course and why some medical men do not take orthopedic courses.

DR. LORING T. SWAIM, Boston: I believe that a great many more orthopedic men should immobilize joints. I have been doing it for ten years and I have not seen any joint that has been harmed, provided immobilization is supervised and done properly and with real gentleness. I have to use persuasion rather than violence. I think the picture Dr. Stump showed of the joint that relaxed in four days with rest was interesting and characteristic. A skin tight plaster should be put on, for even slight motion will cause irritation of the joint.

DR. JOHN P. STUMP, New York: I agree completely with Dr. Sherwood that in this paper differential diagnosis should have been considered, but in the effort to summarize the subject time did not permit completeness. It might have been better to limit the presentation to the prevention of deformities in rheumatoid arthritis. Dr. Sherwood brought out a point about the comfortable position being a position of support and mentioned the use of various braces; in this regard I consider that plaster of paris is a "home remedy." Dr. Hartung's point about six million arthritic patients is well made. Probably there are not enough orthopedists to care for them. However, effort on the part of internists and especially on the part of general practitioners to have some basic knowledge of orthopedic principles would enable them to do a great deal to prevent the deformities that the patient usually has by the time he reaches the arthritis specialist.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

36: 343-526 (July) 1939. Partial Index

*Argentaffine Tumors: Report of Eighty-Four Cases, Three with Metastases. J. E. Porter and C. S. Whelan, Boston.—p. 343.

Effects Induced in Pregnant Rats by Injection of Chemically Pure Carcinogenic Agents. J. M. Wolfe and W. R. Bryan.—p. 359.

Lymphosarcoma in Rats. C. S. McEuen, Montreal.—p. 383.

Cytology of Tumor Cell in Rous Chicken Sarcoma. M. Levine, New York.—p. 386.

Genetics of Nonepithelial Tumor Formation in Mice. C. C. Little, Bar Harbor, Maine; W. S. Murray, Buffalo, and A. M. Cloudman, Bar Harbor, Maine.—p. 431.

Effect of Ascorbic Acid on Hemorrhage Produced by Bacterial Filtrate in Transplanted Tumors. H. B. Andervont, Washington, D. C., and M. B. Shimkin, Boston.—p. 451.

Argentaffine Tumors.—Porter and Whelan reviewed the pathologic material at the Boston City Hospital from 1910 to 1937 and found seventy-two argentaffinomas of the appendix in a group of 26,384 appendixes removed surgically. Also there were seen two argentaffine tumors of the stomach, one of the gallbladder, one of the duodenum and eight of the small intestine. None of the appendical tumors were malignant but of the eight argentaffinomas of the small intestine three were malignant, of which two were found at necropsy and one was removed at operation. The stomach, gallbladder and duodenal cases were all benign. However, all argentaffinomas are potentially malignant. Their grade of malignancy as a rule is low. Treatment is surgical. The function of the argentaffine cell is not known; its origin is probably from the entoderm. It is suggested that argentaffinomas found in obliterated appendixes may be the result of proliferation of the argentaffine cells following chronic inflammation, while the tumors of extra-appendical origin are true neoplasms.

American Journal of Diseases of Children, Chicago

58: 1-236 (July) 1939

The Newborn: President's Address. C. G. Grulee, Evanston, Ill.—p. 1.

Diagnosis of Congenital Cardiac Defects in Infancy: Study of Thirty-Two Cases with Necropsies. Rachel Ash, I. J. Wolman and R. S. Bromer, Philadelphia.—p. 8.

Metabolic Study of Five Children with Nephrotic Syndrome: II. Fat and Protein Metabolism and Creatinine and Creatine Output. C. C. Wang, Corinne Hogden and Ida Genther, Cincinnati.—p. 29.

Sulfur Metabolism of Early Infancy. Vivian Iob and W. W. Swanson, Chicago.—p. 37.

Second Attacks of Experimental Poliomyelitis in Macacus Rhesus Monkeys: III. Immunity or Lack of Immunity to Philadelphia 1932 Strain of Virus. J. A. Toomey, Cleveland.—p. 41.

*New Carbohydrate for Prevention of Nutritional Anemia in Infants: Preliminary Report. C. L. Wilbar Jr., Ewa, Territory of Hawaii.—p. 45.

*Total, Differential and Absolute Leukocyte Counts and Sedimentation Rates of Healthy Children 4 to 7 Years of Age. E. E. Osgood, R. L. Baker, Inez E. Brownlee, Mable W. Osgood, Dorothy M. Ellis and W. Cohen, Portland, Ore.—p. 61.

Insensible Perspiration in Children: V. Influence of Alterations in Vegetative Nervous System Induced by Atropine, Pilocarpine and Epinephrine. G. J. Ginandes and Anne Topper, New York.—p. 71.

Effect of Sleep on Insensible Perspiration in Infants and Children. R. Day, New York.—p. 82.

Tuberculosis in Children Less Than 6 Years of Age. J. Tortone, A. Chattás, Córdoba, Argentina; J. A. Myers, C. A. Stewart and T. Streukens, Minneapolis.—p. 92.

*Accuracy of Clinical Determinations of Blood Pressure in Children with Values Under Normal and Abnormal Conditions. M. Robinow, W. F. Hamilton, R. A. Woodbury and P. P. Vulpitto, Augusta, Ga.—p. 102.

Basal Metabolism of Tuberculous Children: II. Afebrile Primary Pulmonary Tuberculosis. Anne Topper and Jean Shore, New York.—p. 119.

Gynecologic Problems of the Adolescent Girl. E. Allen, Chicago.—p. 162.

Behavior Problems of Adolescents. P. L. Schroeder, Chicago.—p. 168.

Prevention of Nutritional Anemia.—Wilbar describes a new type of carbohydrate for the prevention and treatment of nutritional anemia in infants. It is made from sugar cane, contains considerable amounts of iron and copper and tends to prevent nutritional anemia. A mean value for hemoglobin of 62 per cent (9.8 Gm.) and a mean red cell count of 3,700,000 were found in a study of 242 plantation children of Hawaii examined in 1936. Children of better economic levels showed hemoglobin levels and red cell counts approximating the normal. After a year's use of the new type of carbohydrate, 168 children from 3 days to 3 years of age showed a mean value for hemoglobin of 74 per cent (11.8 Gm.). The following year the mean value for hemoglobin of 171 children in this age group was 80 per cent (12.6 Gm.). The group mainly affected by the new carbohydrate, the infants less than 1 year of age, showed an increase in hemoglobin after using the new type of syrup from 59 per cent (9.3 Gm.) to 74 per cent (11.7 Gm.) to 79 per cent (12.5 Gm.). Seventy-four children less than 3 years of age in the control group who received no supplementary iron still showed anemia after two years, with a mean value for hemoglobin of 57 per cent (9 Gm.). Chemical analyses show from 1 to 3 mg. of iron per hundred cubic centimeters of cane syrup. This iron is all soluble and nearly all in the ferrous state, so that all of it should be available to the body. The amount of copper present in the cane syrup is approximately 0.2 mg. per hundred grams. The amount of iron and copper present in the syrup plus that in the milk approximates the figures given by investigators for the required iron intake for infants and the copper is sufficient to catalyze iron for the formation of hemoglobin. It is suggested that iron as a preventive of nutritional anemia among infants should be given in the form of a readily available food rather than in the form of a medication.

Blood Counts and Sedimentation Rates of Healthy Children.—Osgood and his colleagues give the total, differential and absolute leukocyte counts and sedimentation rates for healthy children from 4 to 7 years of age. As in similar studies the range which will include about plus or minus three probable errors, or 95 per cent, of healthy persons is given. The differential and absolute cell counts show a higher proportion of lymphocytes (from 1,500 to 8,500) and a lower proportion of neutrophil lobocytes (from 1,500 to 7,500) (polymorphonuclears) than have usually been given. The probable explanation for this is that most of the data previously reported have not been obtained on strictly healthy persons. The percentages of lymphocytes (20 to 70) and neutrophils (16 to 60) are the same as for children from 8 to 14 years of age, but the percentage of lymphocytes is higher and the percentage of neutrophils lower than for adolescents or adults. The percentage of eosinophils (0 to 8) is slightly higher than for adolescents or adults. The percentage of monocytes (0 to 7) is slightly lower than for adolescents or adults. The sedimentation rates form a skew curve, with the greatest number of determinations falling in the lower levels. It is probable that the rate of 15 mm. in forty-five minutes, which includes 80 per cent of the results, represents the strict upper limits of normal and that the higher rates are due to mild chronic infection of the tonsils, teeth or sinuses not detectable in routine physical examination.

Blood Pressure in Children.—Robinow and his co-workers tried to ascertain the proper width of the cuff for infants and children, to evaluate the factors which determine it and to establish standards for normal blood pressure during infancy and childhood. Their results are based on a study of infants and children, both white and Negro, between the ages of 6 weeks and 13 years. The authors find that it is convenient for clinical work to have a small number of cuffs and they suggest the use of three cuffs, measuring 2.5, 5 and 9 cm., respectively. The 2.5 cm. cuff was used in determining the systolic pressure of twenty-two newborn infants. The 5 cm. cuff was used for twelve children less than 1 year of age and the 9 cm. cuff was used for a group of thirty-four children from 1 to 13 years of age. Arterial blood pressures of children were recorded directly by means of the hypodermic manometer and compared with values obtained by the usual clinical methods. Systolic pressure was determined accurately by ordinary clinical procedures when the proper width cuff was used. Diastolic pressure by clinical methods is much less accurate in the case of children. The proper width of the cuff increases with the circumference and with the length of the arm and probably decreases with the compressibility of the arm. All three factors

vary in such a manner that the proper width of the cuff increases with age. Occlusion of an artery raises the systolic and the pulse pressure in the artery immediately above the occlusion. The changes are usually less pronounced in pulses of central contour. The contours of pulses in young children and infants are more central than in older children and adults. Blood pressure increases less with age than is commonly stated. Blood pressure is slightly increased by moderate excitement. Crying, coughing, retching and straining may increase the blood pressure as much as 60 mm. of mercury by raising the intrathoracic pressure. During cyclopropane anesthesia a slight rise of blood pressure was observed in most cases. In a single case marked transient hypertension was observed.

American Journal of Orthopsychiatry, Menasha, Wis.

9: 467-668 (July) 1939. Partial Index

Influences on Emotional Growth Inherent in Teacher's Function: I. What Is the Teacher's Function? W. C. Ryan, New York.—p. 468.
Id.: II. Classroom as Setting for Fulfilment of Function. Elizabeth Healy Ross, Philadelphia.—p. 477.
Id.: III. Preparation of Teachers for Emotional Guidance of Children. Lois Hayden Meek, New York.—p. 494.
The Child's Approach to Reality. Lili E. Peller, Baltimore.—p. 503.
*Behavior Differentials of Children with Intelligence Quotients of 120 and Above and 79 and Below, with Some Reference to Socio-Economic Status. I. S. Wile and Rose M. Davis, New York.—p. 529.
Misconceptions of Legal Insanity. G. Zilboorg, New York.—p. 540.
Sex Taboos, Sex Offenders and the Law. J. Wortis, Baltimore.—p. 554.
Some Aspects of Problem of Adoption. Florence Clothier, Boston.—p. 590.
Personality in Economic Situation. T. Burling, New York.—p. 616.

Behavior and Intelligence Quotients of Children.—Wile and Davis studied the problems of 100 children with intelligence quotients between 120 and 148, and 100 children with intelligence quotients between 50 and 79. Their data may not be wholly characteristic of all children in the same intelligence quotient categories, as their omission of children below the moron level limits deduction concerning mentally defective children as a group. In the superior group infantilism, regressive emotional social behavior and hypochondriac tendencies are much more marked, while in the inferior group disturbing behavior in the home, school maladjustment and intersibling conflicts are the more important problems. The authors draw no specific conclusions from the data presented save to emphasize that both superior and inferior children are exceptional children. Both should be studied in terms of their deviations from physical, intellectual, emotional and social norms. The problems and difficulties of the superior group are not less numerous than those of the inferior group. There is a major distinction in the more ready social adjustability of the superior group that promises a later socio-economic independence. A greater personality threat to the superior group is indicated. Problems of superior and inferior children arise from social-genetic factors and the children reflect their biologic and social origins. Both groups are social challenges which can be met only by diversified forms of educational, vocational and spiritual guidance.

American Journal of Psychiatry, New York

98: 1259-1498 (May) 1939

Survey of Methods Used to Produce "Experimental Neurosis." S. W. Cook, Minneapolis.—p. 1259.
Psychosomatic History and Technics of Examination. H. F. Dunbar, New York.—p. 1277.
Psychotherapy in General Hospital. T. P. Wolfe, New York.—p. 1307.
Psychic Component of Disease Process (Including Convalescence) in Cardiac, Diabetic and Fracture Patients. H. F. Dunbar, T. P. Wolfe, E. S. Tauber and A. Louise Brush, New York, with assistance from Miriam Coffin.—p. 1319.
Metrazol Convulsions in Man: Clinical and Biochemical Studies. S. Katzenelbogen, Baltimore; M. W. Brody, M. Hayman and E. Margolin, Sykesville, Md.—p. 1343.
Therapeutic Significance of Fear in Metrazol Treatment of Schizophrenia. L. H. Cohen, Worcester, Mass.—p. 1349.
Unusual Neuropsychiatric Sequelae of Carbon Monoxide Poisoning, with Report of Case. N. Roth and M. Herman, New York.—p. 1359.
Organization of Ward for Adolescents in Bellevue Psychiatric Hospital. F. J. Curran, New York.—p. 1365.
Concept of Hysteria. P. Schilder, New York.—p. 1389.
Psychiatry in Syria. E. L. Bernstein, Arlington Heights, Mass.—p. 1415.
Unsuccessful Reactions with Psychoanalytic Therapy. G. R. Jameison and E. E. McNiel, New York.—p. 1421.
Hostility in Cases of Essential Hypertension. L. J. Saul, Chicago.—p. 1449.

American Journal of Surgery, New York

48: 219-416 (Aug.) 1939

*Laxative Induced Spreading Peritonitis Complicating Acute Perforative Appendicitis: Results Obtained with Use of Perfringens-Clostridium Welchii Antitoxin and a Partially Maintained Glucose Metabolic Balance. J. O. Bower, J. C. Burns, Philadelphia, and H. A. Mengle, Franklin, N. C.—p. 221.
Abdominal Auscultation. R. T. Vaughan and P. Thorek, Chicago.—p. 230.
*Operative Treatment of Scoliosis. H. F. Ullrich, Baltimore.—p. 235.
Tumors of Mandible. S. G. Schenck, Brooklyn.—p. 253.
Some Common Errors in Diagnosis and Treatment of Chest Problems. J. K. Donaldson, Little Rock, Ark.—p. 260.
Bilateral Empyema. F. Angel and H. A. Mengle, Franklin, N. C.—p. 268.
Wounds of Esophagus. D. R. Jensen, New York.—p. 275.
Fallibility of Prolan A Excretion as Prognostic Agent in Cases of Teratoma Testis. E. J. Grace, Brooklyn.—p. 280.
Tuberculous Meningitis Following Nephrectomy for Renal Tuberculosis: Three Case Reports. G. A. Hawes, New York.—p. 282.
Postoperative Cystitis. F. C. Hamm, Brooklyn.—p. 288.
Anorectal Aspect of Venereal Lymphogranuloma. A. W. M. Marino, Brooklyn.—p. 293.
Perforation of Gallbladder. W. W. Stone and F. M. Douglass, Toledo, Ohio.—p. 301.
Mortality and Morbidity of Acute Appendicitis: Study of 150 Cases. A. B. Raffi, Syracuse, N. Y.—p. 304.
Principles of Surgical Technic, with Particular Reference to Use of Silk. C. H. Lupton, Norfolk, Va.—p. 309.

Acute Appendicitis and Peritonitis.—The management of ninety-eight patients in whom spreading peritonitis developed as a complication of acute perforative appendicitis is discussed by Bower and his collaborators. Of these patients, 90 per cent received one or more laxatives. For this reason the term "laxative-induced spreading peritonitis" is used. The authors find that laxative-induced spreading peritonitis is more virulent than spreading peritonitis not so induced. Laxatives, their dose, number and kind, influence the mortality. The factors influencing the mortality of a spreading peritonitis beyond the control of the surgeon are age, delay in hospitalization, laxatives, complications, morphine preoperatively, enemas before admission, abdominal palpation and the application of ice bags, hot water bottles or poultices. Factors which influence the mortality of spreading peritonitis controllable by the surgeon are correct diagnosis, the evaluation of the immunologic response, when to operate, type of anesthesia, what is done at operation, what is done if the patient is not operated on immediately and what is done if the patient has been operated on immediately. During the last two years the authors have used the concentrated perfringens antitoxin, the 20 cc. syringe containing 10,000 units each of perfringens and vibrion septique antitoxin with an excess estimated to be 30 per cent or more. Patients with serosa intact appendixes and those with localized abscess were not given the antitoxin; only those with spreading processes following perforation were treated. In none of the forty-six patients who received perfringens antitoxin as a part of the treatment for localization before operation did delirium develop. However, it occurred in one instance postoperatively, in a patient who on admission had a urea nitrogen of 50 and later uremia. Patients (fifty-two) who were operated on and then given the antitoxin suffered not uncommonly from mental irritability and delirium. Nausea and vomiting were rare in those given perfringens before operation but frequent in those operated on immediately. The mortality of the forty-six patients was 6.52 and of the fifty-two it was 15.39 per cent. Perfringens antitoxin promotes an early return of intestinal tone. The authors have repeatedly observed patients who, following its administration, have had bowel movements on the third day, and frequently diarrhea. It may be that the reaction of the mucosa of the intestine to the antitoxin is similar to the reaction of the epidermis when an urticaria develops; the resulting congestive edema involving the mucosa may stimulate peristalsis and cause spontaneous evacuation. The ninety-eight patients in this group were admitted to the hospital on an average of ninety-three hours after onset of symptoms, during which time they could not retain fluids. They were seriously ill but were in what might be called "the compensatory stage," "compensating" because the liver was supplying the circulating cell with nourishment in the form of glycogen. There is one function of the liver which, if utilized to the utmost during the compensatory stage, will avert disaster. It has been proved experimentally that the liver of both man and dog can metabolize approximately 1 Gm. of dextrose hourly per kilogram of body

weight. In the "compensatory" stage of spreading peritonitis the temperature is elevated, metabolism is increased and consumption of glycogen is increased over the normal. The liver can be supplied with this necessary amount of fuel by a continuous intravenous injection of 5 per cent dextrose solution, administered thirty drops to the minute; this will supply 2,700 cc. of fluid in twenty-four hours. This amount of fluid is sufficient to maintain water balance but will supply only 135 Gm. of dextrose, which, when metabolized, amounts to approximately 540 calories. An attempt should be made to maintain metabolic as well as water balance. If a patient in the "immunity developing stage" of spreading peritonitis reacts satisfactorily when given one tenth of what the liver can dispose of in the form of dextrose, he should react very much more satisfactorily with from one fifth to one third of what the liver can dispose of. A continuous intravenous injection of 10 per cent dextrose solution will supply the needs of the patient more adequately. The authors use this in a routine manner during the early stages of the disease, diminishing the percentage of dextrose when sugar appears in the urine.

Operative Treatment of Scoliosis.—Ullrich states that the objective in the treatment of scoliosis should be to correct the curvature completely and to maintain this correction permanently. That many curvatures can be completely corrected cannot be denied; indeed, in some, lateral bending alone is sufficient to do this. Correction or correction and compensation are best maintained, the author believes, by operative fusion of a portion of the spine. After complete physical and x-ray check-up, the patient should have exercises to improve posture, increase flexibility of the spine and keep him in close touch with the clinic. This is often continued because of delay in securing operative permission. The patients that are suitable candidates for correction, or correction and compensation, followed by operative fusion of the spine are divided into four groups: (1) those with mild or very flexible progressing curves that can be completely corrected, (2) those with moderate curves in whom partial correction is sought, as well as the reestablishment of body balance, (3) those with severe deformity, together with marked displacement of the trunk, in whom appreciable correction of the primary curve is not the sole object, but rather the reestablishment of body balance, and (4) those with undue pain or fatigue, regardless of the mildness or severity of the deformity, even if the growth period has passed. The patients in the first group are advised to have this treatment, especially when further growth is expected, because it is known that to let such a curve go untreated would result in the development of structural changes in the thorax and vertebral bodies, and as time goes on the possibility of complete correction would be proportionately lessened. On the other hand, to advise such treatment on a young or immature curve, the ends of which are not definite and the primary curve uncertain, would be equally dangerous. To correct and fuse a compensatory curve would leave an imbalance in the primary curve, and the patient would have been far better off untreated. The patients in the second group comprise probably the largest number of candidates for operative treatment. They consist for the most part of preadolescents whose deformity has been observed recently and who have been sent for advice and treatment. Some have curves in the lumbar spine that can be completely corrected, but the primary curve is higher in most. But if a moderate deformity can be corrected to a point below which the deformity is apparent, and at the same time whatever displacement there is be completely corrected, a good clinical result should be expected. When a patient is encountered with a severe rigid curvature with its attendant structural changes in the vertebral column and thorax, as well as poor vital capacity and lowered general health, he should be told that little or no correction of the curve itself will result but that body balance will be reestablished which will greatly improve the general health and make the treatment worth while. Often patients come in complaining of a painful area of the spine and subsequent examination reveals the presence of scoliosis. Such patients often do not have deformities sufficiently severe to warrant a long period of treatment. Exercises and massage should be begun and, if these are not successful, fusion of the painful area is advised. Since the time in bed is not much longer, they are put through the regular correction treatment.

American Journal of Tropical Medicine, Baltimore

19: 309-424 (July) 1939. Partial Index

Nature and Mechanism of Immunity in Various Intestinal Nematode Infections. A. C. Chandler, Houston, Texas.—p. 309.
Difficulties in Diagnosis of Chronic Brucellosis. Alice C. Evans, Washington, D. C.—p. 319.
Flea Antigen in Prevention of Flea Bites. L. S. Cherney, C. M. Wheeler and A. C. Reed, San Francisco.—p. 327.
Problem of Bacillary Dysentery: Five Year Survey. J. Felsen, New York.—p. 333.
Observations on Scorpion Sting and Snake Bite. U. P. Basu, Calcutta, India.—p. 385.
*Observations on Local Measures in Treatment of Snake Bite. F. M. Allen, New York.—p. 393.
Susceptibility of Neotropical Anopheles Pseudopunctipennis, Theobald, 1901, to Nearctic and Neotropical Strains of Plasmodium Falciparum. M. F. Boyd, Tallahassee, Fla., and W. C. Earle, Cuernavaca, Mexico.—p. 405.

Local Treatment of Snake Bite.—On the basis of experiments evaluating the local treatment of venomous bites, Allen states that an occlusive tourniquet can be employed successfully for the treatment of poisoning with strychnine and presumably other substances which are rapidly absorbed and disposed of, but that it is wholly harmful in the management of snake bite and its use should be abandoned. Because of local diffusion and binding of venom the earliest possible excision of a large area of tissue, somewhat as in a radical carbuncle operation, offers hope of benefit. In still more desperate cases, amputation is a more positive remedy. Local refrigeration is of no practical value, unless sometimes as an anesthetic. It multiplies the time during which circulation and absorption can be arrested and inhibits the local destructive action of venom, which is the chief disadvantage of the tourniquet method. Failure to save life under these conditions condemns the tourniquet theory. However, the tourniquet may be sometimes serviceable with or without refrigeration as preliminary to a delayed amputation. Since serum treatment is unavailable or delayed in the majority of snake bite cases, it is important that the effectiveness of mechanical methods such as the Jackson plan and the foregoing procedures be more adequately studied and taught. With the proper use of such methods, it seems possible that the mortality from all kinds of venomous bites may be almost abolished.

Archives of Neurology and Psychiatry, Chicago

42: 189-372 (Aug.) 1939

Recovery from Aphasia Studied in Cases of Lobectomy. J. M. Nielsen and R. B. Raney, Los Angeles.—p. 189.
Action Potentials of Muscles in Normal Subjects. P. F. A. Hoefer and T. J. Putnam, Boston.—p. 201.
Persistence of Fibrillation in Denervated Skeletal Muscle and Its Nonoccurrence in Muscle After Tenotomy. Sarah S. Tower, Baltimore.—p. 219.
Postherpetic Neuralgia in Distribution of Cranial Nerves: Evidence for Sympathetic Mediation and Surgical Cure. O. R. Hyndman, Iowa City.—p. 224.
Influence of Fear, Pharmacologic Action and Convulsion in Metrazol Therapy. M. F. Blaurock, A. A. Low and M. Sachs, Chicago.—p. 233.
Effect of Prolonged Insulin Hypoglycemia on Distribution of Water and Electrolytes in Brain and in Muscle. H. Yannet, with technical assistance of J. F. Iannucci, New Haven, Conn.—p. 237.
*Estrogenic Therapy of Involutional Melancholia. J. B. Dynes, Boston.—p. 248.
Lipoids and Proteins in Fluid Obtained from Approximately Complete Drainage of Cerebrospinal System. W. T. Brown, E. F. Gildea and Evelyn B. Man, New Haven, Conn.—p. 260.
Syphilitic Polyneuritis: Clinicopathologic Entity. A. Simon, Washington, D. C., and S. Berman, Northport, N. Y.—p. 273.
Fatal Hypoglycemia: Clinicopathologic Study. A. L. Sahs, Iowa City, and L. Alexander, Boston.—p. 286.
Intracranial Aneurysms. C. A. McDonald and M. Korb, Providence, R. I.—p. 298.

Estrogen for Involutional Melancholia.—Dynes gave large doses of estradiol benzoate, intramuscularly, to seven patients with involutional melancholia. The physiologic activity of the estrogen was determined by examination of the vaginal smear, determination of the p_H of the vaginal secretion and observation of the staining response of the vaginal mucosa to compound solution of iodine. The patient's improvement or failure to improve was correlated with the changes indicated by these three tests. Except in two cases clinical improvement was definitely correlated with demonstrated effectiveness of the estrogen. The lessening and abolition of the acute agitation and tension occurred from two to five weeks after the beginning of estrogenic therapy. Failure of this therapy in the two cases was attributed to irreversible physiologic changes. No criteria,

either physical or mental, foretell with certainty what benefit will result from estrogenic therapy. However, every patient presenting definite evidence of involutional melancholia should be given an adequate therapeutic trial of estrogen.

Arkansas Medical Society Journal, Fort Smith

36: 67-86 (Aug.) 1939

Analysis and Discussion of Positive Food Reactions in 500 Individuals Afflicted with Arthritis or Rheumatoidal Conditions. W. T. Wootton, Hot Springs National Park.—p. 67.

Use of X-Ray in Chest Examinations by the Physician in General Practice. J. D. Riley, State Sanatorium.—p. 70.

California and Western Medicine, San Francisco

51: 1-72 (July) 1939

Periodic Prepayment Plans. L. S. Goin, Los Angeles.—p. 10.

Poliomyelitic Infection: Its Basic Nature. H. K. Faber, San Francisco.—p. 12.

Experimental Poliomyelitis: Some Basic Contributions to Our Understanding of the Human Problem. E. W. Schultz, Stanford University, Calif.—p. 16.

Poliomyelitis. A. G. Bower and R. W. Meals, Los Angeles.—p. 19.

Id.: Its Treatment. E. B. Shaw, San Francisco.—p. 23.

Diaphragmatic Hernia: Results of Surgical Treatment in 210 Cases. S. W. Harrington, Rochester, Minn.—p. 27.

Chronic Ulcerative Colitis. A. C. Reed, San Francisco.—p. 32.

Indiana State Medical Assn. Journal, Indianapolis

32: 403-444 (Aug.) 1939

Heart Disease: Some Points in Diagnosis. C. J. Clark, Indianapolis.—p. 403.

Geriatrics. J. B. Maple, Sullivan.—p. 406.

Nursing Care of Aged and Chronically Ill Patient. Dotaline E. Allen, Bloomington.—p. 409.

Diagnosis and Treatment of Menstrual Irregularities. R. F. Monroe, Louisville, Ky.—p. 412.

Agranulocytosis Following Treatment of Bacterial Infections with Sulfapyridine: Case Report with Review of Literature. W. A. Shullenberger, Indianapolis.—p. 415.

Retroperitoneal Sarcoma: Review and Additional Case Reports. C. O. Almquist and A. Lieberman, Gary.—p. 417.

The Will to Live. J. R. Frank, Valparaiso.—p. 419.

Journal of Allergy, St. Louis

10: 417-512 (July) 1939

Antigenic Studies by Dale Test: I. Antigenic Relationship of Certain Pollens. S. F. Hampton, A. Stull and R. A. Cooke, New York.—p. 417.

Nature of Grain Dust Antigen Crossed Reactions to Grain Dusts and Smuts. L. H. Harris, Elyria, Ohio.—p. 433.

Studies with Antigens: II. Use of Comparative Skin Reaction Curves in Determination of Skin Reacting Potency of House Dust Extracts. B. G. Efron, New Orleans, and R. I. Dorfman, New Haven, Conn.—p. 443.

*Combined Oral and Subcutaneous Treatment for Ragweed Pollinosis. M. London, Cleveland.—p. 453.

*Unusual Reactions to Slow Epinephrine. J. Cohn, San Francisco.—p. 459.

Practical Application of Allergy-Testing Table. J. W. Thomas, Cleveland.—p. 462.

Combined Oral and Subcutaneous Treatment for Ragweed Pollinosis.—The favorable results in ragweed pollinosis that others obtained by the oral administration of ragweed extract led London to believe that subcutaneous therapy could be enhanced by coincidental oral administration. Combined oral and subcutaneous therapy was tried on twenty-three patients in 1938 who in the previous year were treated by subcutaneous therapy alone. The combined treatment was also given to nineteen patients who had not been treated the previous year. The schedule of progressively increasing quantities of extract injected was maintained in all cases, the factor of oral administration being ignored. Oral therapy was begun during the last week in July and continued until mid August. The initial dose was 2 minims (0.12 cc.) of a 5 per cent extract of mixed ragweed, well diluted with water and administered three times a day after meals. The dose was raised by 2 minims twice a week. Constitutional reactions were exceedingly few and no more than for patients treated subcutaneously alone. Ten of the twenty-three patients given the combined therapy in 1938 fared better on combined treatment than on subcutaneous treatment alone. The improvement ranged from 10 to 45 per cent. Eight patients did not do as well and five reported no difference. Results for patients on combined treatment in 1938 do not differ significantly from the results for patients on subcutaneous therapy alone in 1937. Results for all treated patients with combined therapy are not better than the results the author is accustomed to expect from subcutaneous therapy alone. Considering the personal equation and variable factors involved, it would appear that, on the whole, combined therapy has added little to the orthodox subcutaneous therapy as far as improvement is concerned. Experimental work has shown that absorption of ragweed pollen extract from the intestinal tract, if at all, must be exceedingly small.

Reactions to Slow Epinephrine.—Cohn reports four cases in which slow epinephrine in peanut oil was used with the unusual symptoms of nausea, vomiting, chills, vesicular urticaria, cyanosis, increased dyspnea and swelling and edema of the forearm. Therefore epinephrine in peanut oil is not without its dangers and should not be given promiscuously. It should be used cautiously because of a possible underlying hypersensitiveness to peanut oil as well as side effects the nature of which is not as yet understood.

Journal-Lancet, Minneapolis

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Ectopic Pregnancy. C. G. Owens, New Rockford, N. D.—p. 308.

Indigenous Malaria and Its Vectors in Minnesota. W. A. Riley, Minneapolis.—p. 311.

59: 327-366 (Aug.) 1939

*Faradic Shock Treatment of "Functional" Psychoses: Preliminary Report. N. J. Berkwitz, Minneapolis.—p. 351.

Excretory Urography in Tuberculous and Debilitated Patients, with Special Reference to Use of Organic Iodide Dyes. J. H. Winer and M. E. Greenberger, New York.—p. 356.

Study of Physical Examination Records in Use in Health Services. R. I. Canuteson, Lawrence, Kan.—p. 358.

Biometric Study of Sedative Medication. B. Alpert, Brooklyn.—p. 359.

Faradic Shock Treatment of "Functional" Psychoses.—Since complications such as dislocations and fractures occur in insulin and metrazol shock therapy and because of the terror and apprehension of the patient toward the treatment, Berkwitz offers faradic shock as a probable substitute. He tried this form of treatment in four cases of "functional psychoses" with encouraging results. Because of the small number of cases treated and the short period of time for observations, no definite conclusions are formed. It may be possible that this method may be an adequate substitute for the more drastic forms of shock therapy being used today. Further work is being done in this study. A simple apparatus was devised for the production of a faradic current. The source of the high potential current used for stimulation was a model T Ford spark coil; a six-volt dry cell battery of the A type was used to energize the spark (induction) coil. A resistance of 500,000 ohms (wire wound) was used in series with the secondary winding of the induction coil to reduce the milliamperage of the current used. The maximal voltage produced was approximately 20,000 volts. One electrode was placed on the forehead and the other on the nape of the neck. The patient's breakfast is withheld and an enema is given before the commencement of the treatment. From five to ten shocks of one second's duration each are given with an interval of one second between shocks. Such current can be safely tolerated by patients having no vascular disease. The patient's eyelids and facial muscles twitch, the head jerks, and evidence of fear and pain is exhibited. The patient does not appear to be in mental anguish or to have the violent jerking as is seen in convulsions. Immediately after the electrical shocks are given, from 4 to 7 cc. of a 5 per cent solution of pentothal sodium is injected intravenously to produce prompt sleep. Surgical anesthesia is attained in about thirty seconds. Unconsciousness lasts for several minutes, depending on the amount of the drug administered. Respiration must be watched closely. By the administration of an inhalant such as spirit of ammonia, the patient may be kept awake. Thus the interviewer often may gain much information of the content of the patient's thought which is not obtainable at other times.

Laryngoscope, St. Louis

49: 505-602 (July) 1939

Attempt at Precision Measurements of Ear. I. H. Jones, Los Angeles.—p. 505.

Studies of the Waltzing Guinea Pig. M. H. Lurie, Boston.—p. 538.

Experimentally Induced Circling (Waltzing) in Guinea Pig. M. H. Lurie and E. W. Dempsey, Boston.—p. 565.

Sulfanilamide and Roentgen Ray Therapy for Acute Otitis Media and Mastoiditis. F. D. Woodward, University, Va.—p. 572.

Radical Mastoid Operation; Use of Tensor Tympani Muscle in Closing Eustachian Tube. H. M. Goodyear, Cincinnati.—p. 580.

Prevention of Deafness in Children. S. J. Crowe, Baltimore.—p. 591.

Medical Annals of District of Columbia, Washington

8: 193-222 (July) 1939

Acute Pyuria in Children. H. J. Davis, Washington.—p. 193.
Prolapsus Uteri, with Special Reference to Manchester-Fothergill Operation. F. S. Rogers Jr., Washington.—p. 199.
Clinical Subvitaminotic Deficiency States. R. L. Wells, Washington.—p. 204.
Neuroblastoma: Review and Report of Case. H. H. Donnally, E. C. Rice Jr. and S. W. Giddens, Washington.—p. 208.
Primary Bladder Calculus in 93 Year Old Female. E. H. Markwood, Washington.—p. 213.

Oklahoma State Medical Assn. Journal, McAlester

32: 247-282 (July) 1939

Anatomy of Operative Incisions. E. E. Rice, Shawnee.—p. 247.
Use of Histidine in Treatment of Hunner's Ulcer: Preliminary Report. —p. 249.
Management of Maternity Service with Nurse Attendance at Delivery in Rural Area: Preliminary Report. I. Dyer, Tahlequah.—p. 252.
Temporomandibular Syndrome (Costen's Syndrome). L. K. Emenhiser, Oklahoma City.—p. 256.
Extrapleural Pneumothorax Operation. P. B. Lingenfelter, Clinton. —p. 260.
Tendon Transplantation in Ocular Muscle Paralysis. H. O. Randel, Oklahoma City.—p. 263.

Public Health Reports, Washington, D. C.

54: 1255-1300 (July 14) 1939

Incidence of Cancer in Atlanta, Ga., and Surrounding Counties. J. W. Mountin, H. F. Dorn and B. R. Boone.—p. 1255.
Allergic Irritability in Rheumatic and Nephritic Patients. M. P. Schultz. —p. 1273.
Experimental Treatment of Tumors in Mice: I. By Phenanthrene Derivatives. F. C. Turner.—p. 1279.

54: 1301-1362 (July 21) 1939

Disabling Morbidity Among Employees in Soap Industry, 1930-1934 Inclusive. H. P. Brinton and H. E. Seifert.—p. 1301.
*Studies in Chemotherapy: IX. Antibacterial Action of Aromatic Arsenic, Sulfur and Nitro Compounds. S. M. Rosenthal, H. Bauer and E. Elvove.—p. 1317.
Varieties of Mexican Typhus Strains. M. R. Castaneda and Roberto Silva.—p. 1337.
Ornithodoros Parkeri: Distribution and Host Data: Spontaneous Infection with Relapsing Fever Spirochetes. G. E. Davis.—p. 1345.

Antibacterial Action of Arsenic, Sulfur and Nitro Compounds.—Rosenthal and his colleagues investigated the antibacterial power of compounds structurally similar to some active sulfur compounds but differing in that the sulfur was replaced by trivalent or pentavalent arsenic. The asymmetrical 4-nitro-4'-aminodiphenylarsinic acid and corresponding arsyloxide and arsine were active against streptococcic infections in mice. Acetylation increased activity and lowered toxicity but the effective doses were close to the toxic doses. The symmetrical 4,4'-diaminodiphenylarsinic acid and arsyloxide were inactive. 4-nitrobenzoic acid, the aldehyde, 4-nitrobenzal bromide, 4-nitrobenzyl chloride and 4-nitrotoluene possessed some activity, particularly against pneumococcic infections in mice. The various reduction products of 4-nitrobenzoic acid were inactive, as were likewise the symmetrical and asymmetrical benzophenones and benzhydrols and a series of other nitro and nitroso compounds. Acetylation of 4-nitro-4'-aminodiphenylsulfone decreased its toxicity without decreasing its antistreptococcic activity.

Radiology, Syracuse, N. Y.

33: 1-130 (July) 1939

*Extra-Alimentary Causes of Alimentary Filling Defects. M. J. Hubeny, Chicago.—p. 1.
Limitations of Intracavitary Radium Therapy in Cancers of Cervix of Uterus. A. Lacassagne, Paris, France.—p. 20.
Further Studies on Problem of Mitogenetic Radiation. H. Barth and O. Glasser, Cleveland.—p. 25.
*Roentgen Evidence of Pulmonary Tuberculosis in Supposedly Healthy Individuals. C. F. Baker and W. J. Marquis, Newark, N. J.—p. 34.
Roentgen Diagnosis and Treatment of Carcinoma of Larynx and Pharynx. G. E. Pfahler, Philadelphia.—p. 42.
Pneumatization of Mastoid: Roentgen Study. R. Schillinger, Brooklyn. —p. 54.
Concrete as Protective Material Against High Voltage X-Rays. G. Singer, L. S. Taylor and A. L. Charlton, Washington, D. C.—p. 68.
Value of Radiography of Gallbladder in Upright Position. R. Spillman, New York.—p. 77.
Suppuration in Mastoid and Petrous Portions of Temporal Bone: Roentgen Findings. H. K. Taylor, New York.—p. 79.
Physical Principles of Slit Kymography. M. M. Schwarzschild, New York.—p. 90.

Alimentary Filling Defects.—Hubeny points out that the x-ray method of examining the gastrointestinal tract enables one to appreciate not only organic changes but indirect signs. The gallbladder, the liver, the pancreas and the stomach are embryologically, anatomically, physiologically and pathologically closely related and should be considered as one physiologic system. Because of the continuity and contiguity of these numerous structures it is quite necessary to recognize filling defects as of pathologic and nonpathologic significance. The filling defect is the basic x-ray sign of morbidity. Errors in technic are responsible for some apparent defects. Among the most frequent is the neglect of eliminating pressure of the spine on the gastric shadow because of failure to elevate the chest and hips of the patient. The genuineness of a filling defect is portrayed by its persistence under all conditions during fluoroscopic examination, its unaltered position and contour after massage, its constancy on all roentgenograms and successive examinations and the lack of obliteration after the administration of antispasmodics. The permanence and actuality of a filling defect cannot always be determined by taking only a few roentgenograms. The filling defect may correspond to a palpable mass, for in occasional instances tumor masses that elude detection at the physical examination are felt by the roentgenologist. Unevenness of outline and lack of symmetry are rather constant in true filling defects. Abdominal rigidity and tension, pressure of a deformed costal arch, ascites, ovarian cyst or pregnancy may produce irregularities in the outline of the alimentary canal. Faulty mediums in which the barium is not evenly distributed may be misleading. Gas in the colon or fecal matter in the adjacent intestine also may cause indentations; however, palpatory shifting will help to identify these. Abnormal ligaments, peritoneal adhesions or membranes may produce filling defects. Commencing at the mouth, the first defect noticeable may be the esophageal indentation produced by the aortic arch, which is liable to be accentuated by the presence of aneurysm. The next irregularity is produced by the anatomic relation of the esophageal opening in the fornix of the stomach, accentuated or moderated by the angle of entrance. Sometimes the diaphragm produces an irregularity which is caused by the apposition of the cardia and the muscular interdigitations of the diaphragm. This has been noted especially in cases in which tight corsets have been worn. The spleen is the next offender, the shadow produced being quite characteristic. A physiologic kyphotic or lordotic spine may simulate defects. The gastric shadow is sometimes affected by the pressure of the transverse colon or a filled hepatic flexure which may impinge on the pyloric region. In some instances the gallbladder, either pathologic or nonpathologic, but especially the former, may subtract from the area of the pyloric region, particularly along the greater curvature. The third portion of the duodenum may show irregularities as it passes over the spine. It often happens that a concentric arrangement of portions of the jejunum or ileum, especially the latter, will cause apparent filling defects of the adjacent intestine, especially misleading when a non-visualized mass is contained in the lumen of the intestine. The foregoing conditions typify the usual probable sources of confusion, which can readily be recognized if anticipated. Among some of the pathologic conditions which produce filling defects are carcinoma, lymphosarcoma, splenomyelogenous leukemia, splenic leukemia, syphilis, varicosities, adhesions and benign tumors such as uterine fibroids and ovarian cysts. The history, physical examinations, laboratory observations, clinical and anatomic diagnosis and the work-ups of twenty-one cases are presented.

X-Ray Evidence of Tuberculosis.—Baker and Marquis emphasize the unexpected finding of tuberculosis in a large number of supposedly well people who had, immediately preceding an x-ray examination, passed a satisfactory physical examination. Instances are cited in which people have lost little or no time from work for years and yet were, by chance, found to be suffering from tuberculosis of one or both lungs, with cavitation and markedly positive sputum. Of a group of healthy male factory workers, examined only because they were about to be transferred to work known to be hazardous, 6 per cent were found to show pulmonary signs of sufficient gravity to prohibit the transfer. The authors believe it probable that more than 1 per cent of their readers, although considering themselves well, would be discovered to have either tuberculosis

or some other serious pulmonary lesion if they submitted to an x-ray examination. They arrive at this opinion after a study of the records of the Prudential Insurance Company and their own observations since Sept. 1, 1934. Even those who feel well should be urged to submit occasionally to an x-ray examination of the lungs. This becomes more urgently necessary if a person has frequent colds or feels tired to an unusual degree without known cause. The general practitioner can do more in this matter than the specialist, for he is ordinarily the first one to see the patient.

Rhode Island Medical Journal, Providence

22: 133-146 (Aug.) 1939

Blood Chemical Changes in Nephritis. R. O. Bowman. Providence.—p. 133.
Spirochaetosis Icterohaemorrhagica. H. G. Lashey, Carolina.—p. 135.

Surgery, Gynecology and Obstetrics, Chicago

69: 129-256 (Aug.) 1939

Experimental Production and Specific Treatment of Gallbladder Disease. G. M. Nelson and M. E. Rehfuss, Philadelphia.—p. 129.
Intestinal Polyps: Pathogenesis and Relation to Malignancy. R. J. Coffey and J. A. Bargen, Rochester, Minn.—p. 136.
Tetanus at the John Sealy Hospital: Observations on Distribution of Tetanus Throughout the United States. R. M. Moore and A. O. Singleton, Galveston, Texas.—p. 146.
Results of Attempted Induction of Labor with Estrin. S. Lubin and R. Waltman, Brooklyn.—p. 155.
Pyelonephritic Contracture of Kidney. F. Lieberthal, Chicago.—p. 159.
*Carcinoma of Breast, End Results: Massachusetts General Hospital 1930, 1931 and 1932. C. C. Simmons, G. W. Taylor and C. E. Welch, Boston.—p. 171.
*One Stage Thyroidectomy for Thyrotoxicosis in the Aged. H. M. Richter, J. M. Mora and D. H. Wagner, Chicago.—p. 178.
Anomalies of Renal Rotation. H. M. Weyrauch Jr., San Francisco.—p. 183.
Intracapsular Femoral Neck Nonunion. W. R. Hamsa, Omaha.—p. 200.
Technical Notes on Congenital Indirect Inguinal Hernia. S. J. Seeger, Milwaukee.—p. 207.
Treatment of Thoracic Empyema. A. L. d'Abreu, Cardiff, Wales.—p. 209.
Conservative Myomectomy. B. Zondek, Jerusalem, Palestine.—p. 214.
Madelung's Deformity and Associated Deformity at Elbow. C. F. Thompson, Indianapolis, and B. Kalayjian, Charleston, S. C.—p. 221.
Open Reduction of Fractures with Special Bone Approximator. B. Dávila, Río Piedras, Puerto Rico.—p. 231.
Interscapulothoracic Amputation for Malignant Tumors of Shoulder Region. D. H. Levinthal and A. Grossman, Chicago.—p. 234.
Treatment of Chronic Empyema by Continuous High Vacuum Suction. J. V. H. Neville, Forsyth, Mont.—p. 240.
Direct Inguinal Hernia and Method of Fascial Repair. E. H. Carnes, Memphis, Tenn.—p. 247.

Carcinoma of Breast.—According to Simmons and his associates, from five to eight year cures were obtained in 70 per cent of sixty cases in which the carcinoma was confined to the breast and in 31 per cent of the 114 cases in which the axillary nodes were involved. The improvement in curability, as compared with previous series, may be attributed to standardization of the radical operation and to better selection of cases. Some improvement may be due to shortening of the preoperative duration of the disease as a result of educational programs. Radiation therapy was not employed in the present series. Clinical appraisal of axillary lymph node involvement is highly fallible. Nodes may be involved in nearly half of the cases in which no nodes can be felt clinically, and in half of the cases in which exploration of the primary tumor in the breast is necessary to establish the diagnosis of carcinoma. In high grade malignant carcinomas the tendency is to metastasize earlier and there is a markedly lessened chance of cure by radical operation. The age of the patient is of prognostic importance only in that younger patients tend to present more malignant grades of carcinoma and earlier metastasis to the axilla. Exploratory incisions, followed by immediate radical operation, do not seem to jeopardize the likelihood of cure. Recurrence in the operative field is rare if proper selection of cases and proper operation are carried out.

One Stage Thyroidectomy in Aged.—Richter and his colleagues state that 270 consecutive one stage thyroidectomies were performed on thyrotoxic patients from 50 to 77 years of age. Not one death occurred. During the period in which these patients were operated on, 900 thyroidectomies for thyrotoxicosis in every age group were performed with three deaths. These data are presented as evidence in favor of the routine use of a radical one stage operation for thyrotoxicosis in the aged.

Tennessee State Medical Assn. Journal, Nashville

32: 225-262 (July) 1939

Epilepsy: Diagnosis and Treatment. J. P. Gilbert, Nashville.—p. 225.
Appendicitis in Children. W. H. Thompson, Minneapolis.—p. 232.
Postmenopausal Bleeding. W. C. Dixon, Nashville.—p. 237.
Analysis of Seventy-Five Consecutive Cases Admitted for Venereal Diseases. E. C. Lowry, Carlisle, Pa.—p. 243.

Texas State Journal of Medicine, Fort Worth

35: 197-258 (July) 1939

*Diagnosis of Causes of Obscure Fever. C. S. Keefer, Boston.—p. 203.
Modern Treatment of Malarial Infections. C. F. Craig, San Antonio.—p. 213.
Methylene Blue Therapy in Chronic Gastrointestinal Conditions. Martha A. Wood, Houston.—p. 218.
Mechanisms and Management of Failure in Peripheral Circulatory System. G. Herrmann, Galveston.—p. 221.
Routine Examination of Food Handlers. T. C. Terrell, Fort Worth.—p. 227.
Survey of Laboratory Facilities in Texas. S. W. Bohls, Austin.—p. 229.
X-Ray Treatment of Benign Diseases of Prostate. R. E. Barr, Beaumont.—p. 231.
Female Urethra in Childhood. H. M. Spence and H. Moore, Dallas.—p. 234.
Management of the Surgical Diabetic. L. I. Ross, San Antonio.—p. 238.
Progress of Specialty of Public Health and Its Relation to General Field of Medicine. C. C. Green, Houston.—p. 242.

Diagnosis of Obscure Fever.—Keefer bases his remarks on a study of eighty cases of obscure fever. In any consideration of the diagnosis of an obscure fever, one must take into account geography, climate and the prevalence of certain diseases in a particular community. Also the history of previous infections, the possibility of contact with other known infections and the habits of the individual must be investigated. The methods employed in establishing a diagnosis varied with individual cases and included the isolation of a specific infectious agent, the demonstration of specific serologic reactions, the appearance of characteristic clinical signs of disease, the biopsy of tissue and the use of the x-rays. In a few, the diagnosis was established only by means of surgical exploration or by necropsy. In the group of cases in which fever was caused by infections, the commonest causes were tuberculosis, staphylococci, streptococci and undulant fever. While it is always important to approach the medical problems of any disease from the point of view of etiology, it is always necessary to find the anatomic location of the disorder and then decide on its cause. Indeed, the anatomic location of a disorder often suggests the etiologic nature of the process. The second large group of cases in which fever was a prominent feature consisted of ten patients with tumors, the commonest sites being the gastrointestinal tract and the kidney. Diseases of the blood forming organs composed the next largest group and these included Hodgkin's disease, infectious mononucleosis and primary diseases of the bone marrow. The diagnosis in these cases depends on the careful examination of the blood, the clinical course and the use of bone marrow biopsy and sheep cell agglutination tests. As fever is usually the result of a temporary loss of the equilibrium between heat production and heat loss, it is not surprising to find that increased heat production without compensatory loss, normal heat production with an associated inability to lose heat in the normal fashion, or an actual central disturbance of the normal heat regulatory mechanism may cause an elevation of the body temperature above the normal level. One finds that fever may be a feature in hyperthyroidism or dinitrophenol poisoning in which there is a great elevation of the metabolic rate, or it may be a feature in diseases in which the patient has difficulty in losing heat through the skin. This may be true of patients with heart failure, in hypothyroidism, scleroderma, congenital or acquired absence of the sweat glands (congenital ectodermal dysplasia, congenital ichthyosis and acquired anhidrosis) or following drugs which suppress sweating as well as in the presence of anemia. All the foregoing features must be considered in the analysis of any case in which prolonged fever is a feature.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Rheumatic Diseases, London

2:161-248 (July) 1939

Rheumatic Nodules in the Heart. L. Aschoff.—p. 161.
Review of Recent Italian Work on Rheumatism: I. Rheumatic Fever. P. Ravenna.—p. 167.
*Formol-Gel Reaction and Erythrocyte Sedimentation Rate in Acute Rheumatism. C. A. Green, S. Thomson and A. J. Glazebrook.—p. 180.
Rheumatic Subcutaneous Nodule Formation. F. D. Hart.—p. 196.
Sociologic Aspects of Treatment of Arthritis: Notes on Visit to the United States. J. J. R. Duthie.—p. 201.
Juvenile Rheumatism in London. F. Bach, N. G. Hill, T. W. Preston and C. E. Thornton.—p. 210.

Formol-Gel Reaction and Sedimentation Rate in Rheumatism.—Green and his associates determined the average erythrocyte sedimentation rate of 102 male rheumatic convalescents from 16 to 19 years of age, the hematocrit volume and the formol-gel test. In 99.2 per cent of the patients, on discharge from hospital, the erythrocyte sedimentation rate was more than 80, and in 81.4 per cent the hematocrit volume was 45 or over. The formol-gel test was usually negative. The 464 results of erythrocyte sedimentation rates and formol-gel tests on blood specimens from the 102 cases are compared. Positive formol-gel reactions occurred in 97.1 per cent of specimens with an erythrocyte sedimentation rate below 60, as compared with 2.6 per cent in specimens with rates above 80. In 92.3 per cent of fifty-four specimens with hematocrit volumes less than 40 a positive formol-gel reaction was obtained. The formol-gel reaction was much less affected by delay than was the sedimentation test. In its quantitative form the formol-gel test furnished useful information regarding the progress of the individual case. Its utility becomes even greater if there is any possibility of delay in the examination of specimens. Delay, even up to thirty-six hours after the collection of blood, had little or no effect on the formol-gel test, whereas any delay beyond three hours or less may completely invalidate the results of the erythrocyte sedimentation rate.

British Journal of Dermatology and Syphilis, London

51:301-342 (July) 1939

Eczema Mammarum Symmetricum: Clinical Study. R. Leszczyński.—p. 301.
Glomus Tumor: Doubts and Difficulties in Diagnosis. J. H. T. Davies, F. F. Hellier and R. Klaber.—p. 312.
*Toxic Erythema, T. A. B. (Intravenously), Coronary Thrombosis and Sudden Death. R. J. Lockhart.—p. 318.

Toxic Erythema.—Lockhart reports the death of a patient following the injection of triple typhoid vaccine (T. A. B.) intravenously for desensitizing purposes. The patient was admitted with a generalized toxic erythema. The palms were cracked and fissured, dry and scaly and showed marked keratosis. The dorsum of both hands was red, dry and peeling. This appearance extended up both arms, gradually fading toward the shoulders, ending there in a few scattered red papules. The appearance of the lower extremities was similar. A red papular eruption covered both scapulas and extended down the sides of the thorax. Some improvement occurred with the local application of soothing and healing liniments and ointments. Sixteen days after admission an intravenous injection of T. A. B. (0.12 cc. in 1 cc.) was given to desensitize the patient, at which time the patient's temperature, pulse and respiration were 97 F., 96 and 20, but three hours later the corresponding figures were 103.6, 142 and 40. The patient showed no deviation from the normal reaction to such an injection until shortly after this time, when he suddenly collapsed. He was ashen gray, cold, sweating and gasping for air. The temperature fell rapidly from 103.6 to 98.5 F., respirations rose to 54 and the pulse became imperceptible. The heart sounds were inaudible, and crepitations were heard all over the chest. Epinephrine was given intravenously. The patient rallied slightly, becoming warmer, and his color improved. It was decided to repeat the epinephrine in thirty minutes, but within twenty minutes his condition rapidly deteriorated. A 25 per cent solution of pyridine betacarbonic acid diethylamine was injected, but without avail. At postmortem examination there was found a complex heart disease. A three to four months old infarct was present in the lower two thirds of the anterior wall of the left ventricle, and the coronary artery of supply, the anterior descending branch of the left artery, showed an organizing and partly recanalized thrombus about 2 cm. from its stem. Immediately proximal to this there lay a second—a recurrent—thrombus, fresh and unassociated with any new infarct changes. This left coronary artery and to a lesser extent the other branches had for some time been seriously occluded by atheromatous disease. In view of the postmortem observations the author wonders whether the second thrombus was coincident with the injection or precipitated by it. He can find only four cases in the literature in which acute thrombosis has occurred following the use of T. A. B. injections. Petersen (1921) has classified the clinical results of the so-called focal reactions produced by foreign protein under three heads: stimulation of inflammatory foci of infectious or noninfectious origin and stimulation of latent diathetic phenomena. It is believed that the present instance probably falls under the last heading. The author suggests that electrocardiograms as a routine would seem to be the best safeguard against similar misfortunes in subsequent cases in which this treatment is employed.

British Journal of Experimental Pathology, London

20:201-296 (June) 1939

Action of Proteolytic Enzymes on Antitoxins and Proteins in Immune Serums: II. Heat Denaturation After Partial Enzyme Action. C. G. Pope.—p. 201.
Preparation of Diphtheria Antitoxin in a State of High Purity. C. G. Pope and Margaret Healey.—p. 213.
Influence of Pancreas and of Pancreatic Preparations Used for Extraction of Certain Fractions from Bacteria Aertrycke on Oxygen Uptake of Brain and Muscle Suspensions: Correction. M. E. Delafield and H. A. Smith.—p. 216.
Comparison of Photodynamic Activity of Some Carcinogenic with Non-carcinogenic Compounds. I. Doniach.—p. 227.
Studies on Bacillus Pestis Antigens as Prophylactic Agents. H. Schütze.—p. 235.
Antigenic Properties of Streptolysin. N. W. Abdalla and J. W. McLeod.—p. 245.
Pseudolymphocytic Choriomeningitis. F. O. MacCallum, G. M. Findlay and T. M. Scott.—p. 260.
Cataphoresis Experiments with Sensitized Erythrocytes. C. G. Anderson and T. J. Mackie.—p. 270.
Properties of Antigenic Preparations from Brucella Melitensis: III. Biologic Properties of Antigen and Products of Gentle Hydrolysis. A. A. Miles and N. W. Pirie.—p. 278.

British Journal of Ophthalmology, London

23:433-504 (July) 1939

Choroidal Angiosclerosis, with Special Reference to Its Hereditary Character. A. Sorsby.—p. 433.
Aleukemic Lymphosis Involving Upper Lids: Pathologic Findings: Case. F. T. Tooke.—p. 444.
Note on Chronic Iridocyclitis, with Special Reference to Sarcoidosis of Boeck. R. Kemp.—p. 455.
*Study of Diet in Relation to Health: Dark Adaptation as Index of Adequate Vitamin A Intake: II. New Photometer for Measuring Rate of Dark Adaptation. A. M. Thomson, H. D. Griffith, J. R. Mutch and D. M. Lubbock, with assistance of E. C. Owen and J. Logaras.—p. 461.
Note on Three Cases Showing "Crocodile Tears" After Facial Paralysis. L. H. Savin.—p. 479.
Localization of the Meridian Determined by Perimetric Measurement on Outside of Sclera. I. Abramowicz.—p. 482.

Dark Adaptation and Vitamin A Intake.—According to Thomson and his co-workers, a modification of Edmund and Clemmesen's method was used to assess degrees of dark adaptation in a scheme of an extensive clinical and dietary survey in order that its usefulness for diagnosing vitamin A deficiency might be determined. However, it soon became apparent that the results were difficult to interpret in many cases owing to the presence of two variables (i. e. the light control by means of Tscherning glasses and the range of test letters). The power of distinction might be excellent at the low illuminations and poor at high illuminations or vice versa. For this reason a new adaptometer was designed in which only a black test letter was used and with another type of light control which could measure finer gradations than the Tscherning glasses. The method described differs from most others in using white light for the test. Results will be reported of an investigation into rates of dark adaptation obtained in groups of subjects whose diets differed widely.

British Medical Journal, London

1: 1269-1316 (June 24) 1939

*Dental Sepsis in Relation to Anemia, Dyspepsia and Rheumatism, with Particular Reference to Treatment. J. M. Vaizey and A. E. Clark-Kennedy.—p. 1269.
Potassium Tellurite in Diagnosis of Diphtheria. E. Tomlin.—p. 1273.
Immediate Tellurite Test in Diphtheria. J. B. L. Tomlinson and R. M. Campbell.—p. 1275.
Treatment of Cerebrospinal Meningitis: Review of 103 Cases. W. J. Roche and C. J. McSweeney.—p. 1278.
Three Cases of Cerebrospinal Fever Treated by Sulfapyridine. W. H. Osborn.—p. 1281.
*Fatal Poisoning by "Meta Fuel" Tablets. D. R. Lewis, G. A. Madel and Joan Drury.—p. 1283.

Dental Sepsis, Anemia, Dyspepsia and Rheumatism.—Vaizey and Clark-Kennedy studied the after-histories of 234 outpatients in whom all the teeth had been removed for various reasons. Seventy-six of these patients had previously suffered from dyspepsia, and the teeth had been removed on the theory that dental sepsis was responsible for their condition. Only six were benefited. Thirteen had previously suffered from rheumatic symptoms, and extraction of septic teeth appeared to have had a beneficial effect in five. In 126 the teeth had all been extracted for purely dental reasons. In thirty-nine of these patients symptoms of dyspepsia and in nineteen symptoms of rheumatism developed. The widely accepted relation between dental sepsis and dyspepsia and rheumatism is questioned. The mechanical factor resulting from inadequate teeth would appear to be more important than the septic factor in the pathogenesis of dyspepsia. A healthy mouth is valuable largely because it leads to conservation of the teeth. When extraction cannot be avoided, it seems that early, adequate and efficient prosthetic dentistry is essential in the prophylaxis of all types of dyspepsia.

Fatal Poisoning by "Meta" Tablets.—"Meta" is the trade name for tablets used as fuel at picnics. Lewis and his co-workers state that the tablets may be easily mistaken for the popular peppermint lozenge. It is produced by the polymerization of metacetaldehyde and its activity is far greater than that of its isomer paraldehyde. According to Gautier (1928), combustion of meta cannot produce poisoning. It is not scheduled as a poison and its sale is unrestricted. The gardener has taken advantage of its poisonous character to kill slugs and snails, and the method of mixing it with bran has been responsible for the innocent slaughter of many wild birds. It is slowly absorbed from the intestine, and by its poisonous action on the central nervous system it produces drowsiness and convulsions. The majority of the recorded cases of accidental poisoning by meta have been in young children, and most of the cases in adults have been attempts at suicide. The fatalities have all occurred in the young. The death of a boy of 2½ years due to "meta fuel" is reported. The authors conclude that to protect the child the public should be warned of meta's dangerous qualities and the state should introduce measures for a safer distribution.

Clinical Science, London

4: 1-102 (June) 1939

Insulin and Alimentary Hyperglycemia in Young Normal Subjects. H. P. Himsworth and R. B. Kerr.—p. 1.
Hyperpnea in Heart Failure. J. McMichael.—p. 19.
Distribution of Pain Arising from Deep Somatic Structures with Charts of Segmental Pain Areas. J. H. Kellgren.—p. 35.
Observations Relating to Referred Pain, Visceromotor Reflexes and Other Associated Phenomena. T. Lewis and J. H. Kellgren.—p. 47.
Serum Sodium Level in Patients Suffering from Tuberculosis: Note. J. O. Westwater, D. Stiven and R. C. Garry.—p. 73.
Ocular Effects of Sympathetic Stimulation in Man. E. E. Pochin.—p. 79.
Mechanism of Lid Retraction in Graves' Disease. E. E. Pochin.—p. 91.

Glasgow Medical Journal

132: 257-308 (June) 1939

*Influence of Acid Feeding on Utilization of Mineral Elements. S. V. Telfer.—p. 257.
Anesthesia and Analgesia in Obstetrics. E. B. Cowan.—p. 269.

Influence of Acid Feeding on Mineral Utilization.—A metabolic experiment has been carried out by Telfer on a young subject maintained exclusively on a milk diet affording a large mineral intake, to ascertain the effects of acid ingestion (hydrochloric acid) on the utilization of the mineral elements. It was shown by the increase in the renal output of lime, magnesia and phosphoric acid and in the ratio of urinary to fecal phosphorus that a higher degree of absorption of all the components of the mineral intake is induced. The quantities retained are slightly diminished, which would appear to indicate that the process of calcification is adversely affected, presumably through the absorption of an excess of acid or of acid products. From the increase in absorption and the fall in retention it is inferred that the administration of hydrochloric acid must tend to increase the concentration of the mineral elements in the blood. Under the conditions of the experiment the excess of phosphorus eliminated by the kidney after acid ingestion is derived from the intake and is primarily dependent on an increase in absorption; but it includes a small proportion of phosphorus which in normal circumstances would be utilized in growth, probably with lime in the process of calcification. The changes produced by the administration of hydrochloric acid in the treatment of postoperative tetany are described.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

46: 409-644 (June) 1939

Nature of Pain of Labor. C. Moir.—p. 409.
Relief of Pain in Labor. J. Sturrock.—p. 426.
Remote Prognosis of Toxemias of Pregnancy: Based on Follow-Up Study of 400 Patients in 589 Pregnancies for Periods Varying from Six Months to Twelve Years. F. J. Browne and Gladys H. Dodds.—p. 443.
*Recurrent Pregnancy Toxemia. R. J. Kellar.—p. 462.
Study of Trichomonas Vaginitis in Hospital Practice in Edinburgh. W. G. Liston and W. A. Liston.—p. 474.
Treatment of Pyosalpinx. W. F. T. Haultain.—p. 503.
*Placenta Praevia: Review of 251 Cases. R. Caldera.—p. 531.
Effect of Labor on Plasma Uric Acid and Urea. M. D. Crawford.—p. 540.
Adjustable Abdominal Retractor. K. V. Bailey.—p. 554.

Recurrent Toxemia of Pregnancy.—As the available material on recurrent toxemia of pregnancy is scanty, Kellar draws attention to this condition and suggests that those who have cared for such patients record their observations. The author states that, according to current beliefs, a woman who recovers from a toxemic pregnancy may be affected in one of the following ways: 1. She may recover completely and not show any signs of disease whether or not she has further pregnancies. 2. She may develop frank glomerulonephritis and her condition deteriorates progressively, death being accelerated by further pregnancies, which, however, are apt to terminate prematurely. 3. She may remain perfectly well between her pregnancies but with each successive pregnancy toxemia ensues. It is particularly this type of patient that the author's paper is considering. He discusses the pathologic records of three patients suffering from recurrent toxemia. Evidence of chronic glomerulonephritis was not found in any of these three cases. In one case there was generalized arterial thickening of the smaller renal vessels and the renal lesion was typical of essential hypertension. In summarizing the admittedly scanty postmortem material he finds that a woman dying months or years after a toxic pregnancy is far more likely to have generalized arteriosclerosis than glomerulonephritis. Clinically there is a great tendency for a woman who has had a toxic pregnancy to develop persistent hypertension in subsequent years. Pregnancies which occur after the initial toxic pregnancy are liable to be complicated by toxemia in a majority of cases. Death occurring in this group of cases takes place most commonly from the results of prolonged hypertension on the heart, brain and kidney. Hypertension will develop in from one third to one half of these women irrespective of the number of pregnancies. From the established clinical and pathologic facts it seems possible to the author to draw the following conclusions: 1. Toxemia of pregnancy and essential hypertension are in some way closely linked. 2. Toxemia of pregnancy does not appear to be a cause of essential hypertension. 3. It would seem that the woman in whom essential hypertension is destined to develop in later life is peculiarly liable to toxemia of pregnancy. 4. Toxemia will tend to recur in such women and eventually permanent hypertension will develop, but this would have been attained even if the patient had never borne a child. 5. Toxemia of pregnancy may hasten the onset and progress of essential hypertension.

Placenta Praevia.—With the object of ascertaining the local incidence and the factors that influence the mortality from placenta praevia in Colombo, Caldera analyzed the case records of 39,704 (26,116 deliveries) patients who were admitted to the

De Soysa Lying-in Home during the last five years. There were 251 cases of placenta praevia among the 26,116 labors. The term "central" is used when the placenta covers the os completely, "marginal" when it covers only a part and "lateral" when it does not cover the os at all. In the present series 29.5 per cent of the cases were central, 41 per cent marginal and 29.5 per cent lateral. The largest number of cases of placenta praevia occurred in women from 26 to 30 years of age and then in those from 31 to 35 years of age. Of the cases of placenta praevia 167 attained a maturity of thirty-seven weeks. There are fourteen cases of abnormal presentations: ten breech and four oblique. During the last four years there were 199 cases of placenta praevia with twenty-three deaths, giving a maternal mortality of 11.5 per cent. The figures for 1933 are not included, as some of the records were not available. Of the twenty-three deaths, eleven occurred before delivery; in six of these death could be attributed solely to hemorrhage and in five shock following podalic version was an important contributory factor. The remaining twelve patients died after delivery. The deaths in three were due to puerperal sepsis, in eight to shock following podalic version and in one to delivery by the forceps. Thus in no less than twenty cases the cause of death was hemorrhage complicated by shock. Both the variety of placenta praevia and the method of treatment have a marked bearing on the prognosis not only on the life of the mother but also on the life of the child. The maternal mortality of the central variety was four times that of the marginal and sixteen times that of the lateral variety. The percentage of stillbirths for the central, marginal and lateral varieties was 69.6, 49.4 and 45, respectively. Podalic version was the method of treatment adopted in eighty-seven cases. The maternal mortality was 17.2 per cent and the fetal mortality 74 per cent. In thirteen cases of breech presentation the maternal mortality was 7.7 per cent and the fetal mortality 69.2 per cent. Cesarean section is the safest method of delivery for both the mother and the child, and although only five were delivered by this method there were no maternal or fetal deaths. The membranes were ruptured artificially on thirty-eight occasions. There were no maternal deaths and the fetal mortality was 39.4 per cent. Expectant treatment was carried out in forty-three cases, with four maternal deaths and ten stillbirths. The maternal prognosis was most favorable during the earlier period, from twenty-eight to thirty-one weeks of gestation, but the survival rate of the infants at this period was necessarily low.

Journal of Physiology, London

96: 1-108 (June) 1939

Effect of Stretching and of Stimulation on Weight, Total Base and Sodium Concentration of Anterior Retractor of Byssus of Mytilus Edulis. I. Singh.—p. 1.
Indirect Determination of Gas Tensions in Mixed Venous Blood. I. F. S. Mackay.—p. 9.
Gastric Secretions in Experimental Hypochloremia. A. Lyall and B. M. Nicol.—p. 21.
Relation Between Concentration of Visual Purple and Retinal Sensitivity to Light During Dark Adaptation. R. Granit, A. Munsterhjelm and M. Zewi.—p. 31.
Relation Between Force and Speed in Muscular Contraction. B. Katz.—p. 45.
Resistance of Nerve in Relation to Interpolar Length. J. F. Danielli.—p. 65.
Experimental Oligocythemia and Splenomegaly. J. Mellenby and S. F. Suffolk.—p. 74.
Influence of Urea and of Change in Arterial Pressure on Oxygen Consumption of Isolated Kidney of Dog. K. Kramer and F. R. Winton.—p. 87.
Effect on Intestine of Substance Liberated by Adrenergic Nerves in a Rabbit's Ear. J. H. Gaddum, C. S. Jang and H. Kwiatkowski.—p. 104.

Lancet, London

1: 1363-1418 (June 17) 1939

Toxic Goiter, with Special Reference to the Disease in Older People. H. Cookson.—p. 1363.
Deficiency of Vitamin B_6. J. V. Landor.—p. 1368.
*Lymphocytic Choriomeningitis: Isolation of Virus from Nasopharynx. F. O. MacCallum and G. M. Findlay.—p. 1370.
*Sternal Puncture. M. Hynes.—p. 1373.
Chronic Thyrotoxic Myopathy Cured by Thyroidectomy. F. B. Parsons and R. J. Twort.—p. 1379.

Virus of Lymphocytic Choriomeningitis.—In examining material from patients with acute symptoms suggesting involvement of the nervous system, MacCallum and Findlay isolated the virus of lymphocytic choriomeningitis from four patients. The case that they describe was originally diagnosed on clinical grounds as acute anterior poliomyelitis, but the virus of lymphocytic choriomeningitis was isolated from the cerebrospinal fluid once and from nasopharyngeal washings twice. The other three cases will be discussed in a later publication. The isolation of the virus of lymphocytic choriomeningitis on three separate occasions from the same patient and the failure to incriminate the virus of poliomyelitis indicate to the authors that the virus of lymphocytic choriomeningitis was responsible for the clinical condition. The possibility of a double infection must be considered, but as the nasopharyngeal washings failed to yield evidence of poliomyelitis virus there is no experimental proof of its being present. The virus was still present in the nasopharynx eight and twelve weeks after the onset of the illness. Failure to demonstrate neutralizing antibodies in the serum eight weeks after the illness started could, the authors state, be taken as evidence against the specificity of the infection, but the slow development of antibodies in patients infected with this virus has been stressed by Scott and Rivers and by Howard. The data of the present case suggest that the virus of lymphocytic choriomeningitis is probably present at some period in the nasopharynx of individuals suffering from this infection. It may possibly be present in the same situation in healthy carriers, and in persons suffering from febrile symptoms without definite involvement of the nervous system. There is need for renewed study and interest in the cause of acute infections of the central nervous system of unexplained etiology. The virus of lymphocytic choriomeningitis should be searched for not only in cases clinically resembling acute aseptic lymphocytic meningitis but also in other acute nervous and febrile complaints of unknown origin.

Sternal Puncture.—The history and technic of sternal puncture are described by Hynes and an account is given of the changes in the marrow in 109 cases, including thirteen normal subjects, forty-four cases of leukemia, seven of untreated pernicious anemia, six of aplastic anemia, six of myelosclerosis and instances of other conditions. The marrow picture in the so-called aleukemic leukemias does not differ from that of the corresponding leukocythemic leukemias. Irradiation of the spleen in chronic myeloid leukemia improves the marrow picture together with the blood picture. There is a characteristic marrow picture in the various types of anemia, but neither aplastic anemia nor myelosclerosis can safely be diagnosed by sternal puncture. For these a trephine specimen is required. The greatest value of sternal puncture is in the diagnosis of leukemia with leukopenia. The marrow picture in leukemia, whatever the peripheral blood picture, is characteristic. It is extremely cellular, with the normal cell ratio greatly altered by an increase in primitive leukocytes. The proportion of primitive erythrocytes is depressed, but the percentage of erythroblasts is almost equal to that of normoblasts. This "maturation defect" is probably associated with the macrocytic anemia which is almost always seen in leukemia; it differs from the maturation defect of pernicious anemia in that there is no premature hemoglobinization of the erythroblasts. In leukopenic ("aleukemic") forms of leukemia the marrow does not differ from that of leukemia with leukocytosis.

1: 1419-1476 (June 24) 1939

Has the Intellect a Function? W. Trotter.—p. 1419.
*Dermatomyositis and Progressive Scleroderma. G. B. Dowling and W. J. Griffiths.—p. 1424.
*Diagnosis of Hydatidiform Mole by Biologic Assay. M. Boycott and J. M. Smiles.—p. 1428.
Mechanical Respiration: Treatment of Twenty-One Cases. Ursula Blackwell.—p. 1430.
*Bitot's Spots in Ceylon. L. Nicholls and Ananda Nimalasuriya.—p. 1432.
Acute Primary Suppurative Gastritis: Case. F. Hawking.—p. 1434.
Herpes Occipitocollaris: Case. W. J. Tindall.—p. 1435.
Pneumococcic Meningitis Complicating Pneumococcic Empyema Treated Unsuccessfully with Sulfapyridine. J. D. Aitchison.—p. 1436.
Pneumococcic Meningitis Developing During Treatment with Sulfapyridine. J. H. Dowds.—p. 1436.
Pneumococcic Meningitis Treated with Sulfanilylpyridine. H. Dunlop and J. Laurie.—p. 1437.

Dermatomyositis and Progressive Scleroderma.—Dowling and Griffiths believe that dermatomyositis and progressive symmetrical scleroderma are one and the same disease, a process which involves chiefly the blood vessels, the skin and the skeletal muscles throughout the body. The muscles in the two conditions undergo the same microscopic alteration. The

muscular symptoms also are the same in the two diseases, ranging from mild to extremely severe myasthenia. The cutaneous and vascular changes are of the same order. Raynaud's symptoms arise in both, though more frequently in scleroderma with sclerodactylia than in the type of case that is usually termed dermatomyositis. The initial cutaneous symptom in both conditions is usually edema, and the same regions are affected with remarkable constancy; when the edematous phase settles down, the skin becomes densely or superficially sclerosed. In both muscle and skin the changes are degenerative, not inflammatory. Both progressive scleroderma and dermatomyositis have certain characteristics in common with thyroid disease and myasthenia gravis. The common factors are that: 1. The skeletal muscles show exactly similar pathologic changes in thyrotoxicosis, myasthenia gravis and dermatomyositis. 2. Clinically, the muscular symptoms in dermatomyositis and thyrotoxicosis are similar, though different in degree. 3. Creatinuria is common. 4. Certain disturbances in carbohydrate metabolism in thyroid disease have their counterpart in dermatomyositis, and calcium metabolism is affected in both. 5. Microscopically normal thyroids are not found in any case of progressive scleroderma. The authors state that these facts suggest that there is possibly a link between dermatomyositis or progressive scleroderma, thyrotoxicosis and myasthenia gravis. Dermatomyositis is an obscure condition, but they doubt whether it ought to be classed as rare.

Diagnosis of Hydatidiform Mole by Biologic Assay.—Boycott and Smiles report a case which illustrates some of the difficulties and dangers of a diagnosis of hydatidiform mole based on biologic assay. They endeavored to investigate the upper limit of normality for the excretion of gonadotropic hormone in pregnancy. Five women from ten to twelve weeks pregnant were subjected to assay. A positive test was obtained with quantities of urine varying from 0.13 to 1 cc. and negative results with smaller quantities in each case. Urine was also obtained from two cases of hydatidiform mole. Although in one case expulsion of the mole had begun, the Friedman test was positive with 0.033 cc. and negative with 0.028 cc. of urine. Assay in mice showed more than 200,000 mouse units per liter of gonadotropic hormone. In the other case, in which the mole was actively growing, the Friedman test was positive with 0.01 and negative with 0.005 cc. of urine. One case of hyperemesis gravidarum of moderate severity was investigated, the patient being eleven weeks pregnant. The Friedman test was positive with 0.04 cc. of urine. One week later it was positive with 0.06 cc. and negative with 0.05 cc. of urine. The quantitative test in mice was inconclusive. Such comparable evidence as there is goes to show that some women with hydatidiform mole excrete more gonadotropic hormone than is found in any other disorder of pregnancy. On the other hand, cases of hydatidiform mole have been reported which gave a negative test in a rabbit. As far as can be ascertained, the majority of cases of active hydatidiform mole give values not far outside this zone of overlap. A case that the authors describe in detail showed a maximal excretion one tenth of that found in the case of active hydatidiform mole and one third of that in the case in which the mole was in process of expulsion. The patient was not treated for hydatidiform mole as the characteristic "doughy" uterus was absent; there was general improvement in her condition and the hemorrhages ceased. X-ray evidence was of considerable value. Biologic testing is used extensively for the diagnosis of the recurrence of hydatidiform mole or of chorionepithelioma. The case reported by Kobak, in which a normal ten weeks pregnancy was mistaken for a recurrence on the evidence of a high level of gonadotropic hormone in the urine and hysterectomy was performed, shows that even in this connection biologic testing has its dangers. Although it is probable that in some cases of hydatidiform mole a larger excretion of gonadotropic hormone occurs than in any other condition (except chorionepithelioma), on the whole diagnosis of hydatidiform mole on the biologic assay of gonadotropic hormone alone is unreliable.

Bitot's Spots in Ceylon.—Nicholls and Nimalasuriya encountered several hundred cases of changes in the bulbar conjunctiva of the eyes of malnourished children and others in Ceylon, which they refer to as Bitot's spots. The pathologic changes, as seen by them, are of a definite type but do not conform to some of the descriptions given by other observers. They have never seen Bitot's spots extending to the cornea, for they do not regard the changes in the cornea which occur in keratomalacia as extensions of Bitot's spots; and the spots in the great majority of their cases have in no way resembled foam. Bitot said that all his patients had night blindness, but this has not been present in most of the authors' patients. Bitot's spots tend to be chronic and it is necessary to give large doses of fish liver oils or concentrated preparations of vitamin A to clear them. The authors state that it may be that there are two forms of xerosis or keratinization of the bulbar conjunctiva: an acute form in which the changes take place rapidly, forming loose accumulations of degenerate epithelium which appear foamy, and a chronic form in which the accumulations of epithelium take place more slowly and are more compact. If this is so, possibly the first form is more likely to occur as a rare condition in countries in which diets deficient in vitamin A are not in common use, and the second form, as in their patients, will be seen among populations who have become more or less biologically adapted to diets deficient in this vitamin, and consequently their reactions to the deficiency are more chronic.

Medical Journal of Australia, Sydney

1: 851-884 (June 10) 1939

*Chronic Infection and Atherosclerosis. N. W. Jones and A. L. Rogers. —p. 851.
Infections of the Hand. V. J. Kinsella.—p. 856.
Cross Infection by Corynebacterium Diphtheriae in Diphtheria Wards. H. Wilson.—p. 861.
Observations on Massive Intravenous Infusion of Physiologic Fluids. I. J. Wood.—p. 864.

Chronic Infection and Atherosclerosis.—Jones and Rogers cite examples which show that in certain instances of atherosclerotic heart disease there exists a clinical relation to infection and that the removal of the latter beneficially affects the course of the former. They have demonstrated the presence of micro-organisms in the walls of all atherosclerotic vessels in which they searched for them. They stress the importance of the work of Larsell and Fenton, who demonstrated a direct pathway between the paranasal sinuses and the heart, along which streptococci have been shown to travel. And also Winternitz, Thomas and Le Compte have seemingly proved beyond question that the artery wall responds to injury in a true inflammatory manner with increased vascularity and that atherosclerosis is a common result of such reactions. All these investigations point to more than a possible relation of atherosclerosis to chronic infection.

South African Medical Journal, Cape Town

13: 461-506 (July 8) 1939

*Hematologic Studies in Nutrition. J. M. Latsky.—p. 461.
African Relapsing Fever in South Africa: Outbreak of African Relapsing Fever in the Cape Province. D. Ordman.—p. 491.
Tuberculous Meningitis: Laboratory Diagnosis and Incidence in the Cape Eastern Province of South Africa. C. Harington.—p. 499.
Comparison of Clauberg's and Löffler's Mediums in Laboratory Diagnosis of Corynebacterium Diphtheriae. J. F. Murray.—p. 506.

Hematologic Studies in Nutrition.—On the basis of his experimental studies, Latsky asserts that copper possesses an adjuvant function necessary to iron for hemoglobin synthesis. Its property is probably of catalytic nature. It probably has no influence in the absorption of iron but plays no insignificant but a phenomenal part in the synthesis or conversion of this inorganic iron into hemoglobin. Iron plus copper administration results in a dramatic response of general blood regeneration as compared to the insignificant low and slight response of iron therapy alone. Iron plus copper administration also improved the growth, health and general well being of the animals to a more marked extent than did iron alone. Iron plus copper administered to anemic rats resulted in an immediate reticulocyte response, leading to quick maturation of the erythrocytes. The sizes of the matured erythrocytes compared most favorably with those of the most ideally normal animal. Iron alone could not produce this marked hemoglobinization of erythrocytes.

Journal de Chirurgie, Paris

54: 1-144 (July) 1939

*Late Results of Surgical Ablation of Loose Articular Bodies: Thirty-one Cases. R. Leriche, A. Jung and C. Berthel.—p. 1.
Splenic Angle of Colon and Diagnosis of Tumors of Flank and of Hypochondrium. L. A. Surraco.—p. 21.
Technic of Thyroidectomy for Goiter. J.-C. Bloch and P. Maynadier.—p. 48.
Pneumococcic Peritonitis: Clinical and Therapeutic Considerations (Eight Cases). R. Ducastaing.—p. 62.

Late Results of Ablation of Loose Articular Bodies.—According to Leriche and his associates, it is generally accepted as a demonstrated fact that the late results of the surgical ablation of loose articular bodies are good. However, since exact information about this problem is wanting, the authors decided to investigate the cases of loose articular bodies in which surgical treatment was given at their clinic in the years 1926-1938. Their material comprises thirty-one cases. According to the modes of origin, the authors differentiate different groups. First they discuss twelve cases in which osteochondritis dissecans existed. In three of these cases there were two or more loose bodies. The late results were excellent from the clinical point of view. Of twelve patients who had been operated on from six months to twelve years previously, ten declared that the functional results were perfect. In one case, in which arthrotomy of the knee had been done by means of a U-shaped incision, a slight limitation of movements was retained. In another, in which the joint still contains a small loose body, the movements are likewise slightly restricted. The late results are quite satisfactory also from the roentgenologic point of view. X-ray examination of ten patients after intervals of from six months to twelve years showed the old niche in six, whereas in the four others it was invisible. The structure of the epiphysis (outside the niche) and the delineation of the interline were normal. Only three patients presented discrete signs of chronic arthritis, some softness of the interline or mild structural modifications of the epiphysis. The cures seem to be final as a rule. Nevertheless, the possibility of a relapse plays a part in two cases; in one a new loose body is visible, in the other there is a new niche surrounding the first one. The second group of patients discussed were those with articular chondromatosis. The authors show that in these patients the loose articular bodies are often numerous; they cite cases in which from twenty to twenty-five were found. They also observed that synovectomy is useless for these patients. Of the eight patients of this group who underwent surgical treatment for loose articular bodies, only three could be reexamined. In two of these the late results were excellent, whereas in the other one they were unsatisfactory. In the patients of the third group, the loose articular bodies were of traumatic origin. Of nine patients of this group who had been operated on, five could be reexamined from three to ten years after the operation. The late results were good in all of them.

Presse Médicale, Paris

47: 1061-1076 (July 5) 1939

*Lumbocrural Neuralgias of Colonic Origin. M. Brûle and H. Garban.—p. 1061.
Lactic Ferment Therapy of Vesical Infections. A. Fournier.—p. 1062.

Lumbocrural Neuralgias of Colonic Origin.—Brulé and Garban direct attention to the frequency with which patients who have disorders of the large intestine complain of pains in the kidneys. The pain is localized in the lumbar region, from the twelfth rib to the iliac crest; it is localized especially in the superior third of the buttock, a little outside the sacroiliac symphysis and in the root of the thighs, from the anterosuperior iliac spine to the pubic symphysis. At the fold of the groin it radiates inside toward the spermatic cord or the round ligament, to the scrotum or the labia majora and toward the internal surface of the thigh. From the anterior extremity of the iliac crest it crosses the antero-external surface of the thigh, encircles the knee and at times descends along the leg to the great toe. Walking is painful because of the lumbar rigidity and the heaviness in the lower limbs. The pains are intensified by brusque movements and lessened by rest and warmth. They are influenced directly by changes in the intestinal condition; they are aggravated by increased constipation or a mistake in diet and subside only with the amelioration in the colonic disorder. The most constant of these painful points are the gluteal, femorocutaneous, crural and obturator. These neuralgic points correspond to the emergence of sensory branches of the lumbar nervous plexus. There is no neuralgia in the region of the sciatic nerve. Lasègue's sign is negative, whereas the inverse maneuver, that is, hyperextension of the thigh onto the pelvis, often provokes a severe pain at the femorocutaneous and the crural points. The lumbosacral neuralgias develop in organic disorders of the colon, which may be of the acute or of the chronic type. In case of acute disorders such as appendicitis and diverticulitis the pain spreads rapidly over the lumbar region, the buttocks and the inferior members and it regresses again with the same rapidity. In chronic lesions, such as cancer, only a single nervous branch, the femorocutaneous or the crural one, is usually involved. Slow progressive evolution provokes a veritable neuritis and terminates in paresthesia with partial atrophy of the muscles of the thigh and abolition of the patellar reflex. Like the colonic pain, the localization of the lumbocrural neuralgia varies; it may be unilateral or bilateral or oscillate from one side to the other. One day it may be localized in the lumbar region and the following day in the buttocks or the thigh. Often it appears in an atypical form; there are vague pains which the patients designate as rheumatic. The author says that treatment of the cause, that is of the intestinal disorder, is more effective than is local therapy.

Revue Française de Pédiatrie, Paris

15: 117-224 (No. 2) 1939

*Iron in Nutrition of Infants: IV. Investigations on Iron Metabolism of Prematurely Born Infants, Nursed at the Breast, During First Year of Their Existence. A. Wallgren.—p. 117.
Origin of Follicular Tonsillitis in Children. J. Suranyi.—p. 184.
Epidemic of Scurvy in a Boarding School. Lydia Bytch.—p. 188.
Epithelioma of Kidney in Child: Case. P. Bertoye, G. Bertrand and B. Muller.—p. 193.
Craniohypophysial Xanthomatosis: Schüller-Christian's Disease. P. M. Rodier and Mignot.—p. 202.

Iron Metabolism of Premature Infants.—Wallgren's investigations were made on eight prematurely born infants whose ages varied between 2 weeks and 8½ months. Their weights at birth were between 1,040 and 2,100 Gm. All the infants were nursed at the breast. During the two or three months in which there usually takes place a physiologic postfetal destruction of the blood, eleven of thirty-one tests revealed a negative balance for iron. The low hemoglobin values of prematurely born infants in comparison with those of the infants born at term, toward the end of the aforementioned period, is not attributable to a lack of iron provoked by an abundant elimination of iron, because during this period, when the hemoglobin value cannot be raised by the external introduction of iron, the quantity of iron liberated by hemolysis and thus available is abundant. During this same period no relation whatever can be demonstrated between the iron balance and the hematologic picture. During the first four months of existence the iron balance is principally in relation with the degree of storage of the iron liberated by hemolysis, but this storage varies in quantity in different subjects. If the hematologic values of the prematurely born infants are inferior to those of infants born at term, so is this attributable to the fact that the hemolysis is more intense in the premature, probably by reason of the more embryonal nature of their blood at the time of birth. The inferiority of the hematologic values in the prematurely born can hardly be explained by the hypothesis that the bone marrow functions less satisfactorily. The tests made on prematurely born infants after the period of postfetal hemolysis generally revealed a positive balance; among eleven tests there were only three that were negative. This result signifies that at this period the organism uses sparingly the iron stored in the organism or furnished by the food. A comparison with what takes place in the infants born at term reveals no essential differences that would explain why the hematologic values of prematurely born infants are at this time inferior to those of infants born at term. The abundance of reticulocytes in the blood of prematurely born infants does not indicate that their hematopoietic organs are in a state of functional immaturity which renders them incapable of produc-

ing erythrocytes as rapidly as infants born at term. The volume of the blood must increase more rapidly in the prematurely born infant than in the infant born at term, and thus they first require more hematogenic material, especially iron, than do the latter. The function of the hematopoietic organs is likewise taxed more in prematurely born infants. It is probable that their greater needs cannot always be satisfactorily met and this discrepancy between need and supply, on the part of the bone marrow and the iron, is the reason that the prematurely born infants are not always able to maintain their hematologic values at the same level as the infants born at term. The fact that some prematurely born infants develop an anemia whereas others do not can be explained either by a different degree of prematurity or by different functional capacities of the bone marrow and by the different iron supplies in the depots. Nevertheless it is absolutely certain that factors of an exogenic nature, such as errors in feeding and care or infections, are of extreme importance in the anemias of prematurely born infants. These infants are exposed to such exogenic factors to a greater extent than are the infants born at term; moreover, they are more susceptible than the latter.

Sang, Paris

13: 579-704 (No. 6) 1939

Granulocytopenia (Schultz's Disease): Clinical Aspects, Blood Pictures and Examination of Sternal Bone Marrow in Granulocytopenia. F. Velasco Montes.—p. 579.
Anemias of Chronic Malaria. J. Lebon and A. Manceaux.—p. 608.
*Clinical Value of Determination of Coagulability of Blood by Coagulometractovisometry During Pregnancy and in Course of Gynecologic Disorders. L. Blacher.—p. 624.

Coagulability of Blood During Pregnancy.—Blacher made his studies on the coagulability of the blood of pregnant women and of patients with gynecologic disorders with his own method of coaguloretractovisometry (abstracted in THE JOURNAL April 22, 1939, p. 1640). He found that during the final weeks of normal pregnancy the coagulability of the blood is normal, with the exception of an augmented retraction of the clot. On the other hand, during early pregnancy, complicated by gravidic vomiting, the coagulability of the blood exhibits greater or lesser deviations from the normal. In extra-uterine pregnancy all the reactions of the coagulability of the blood are altered: most disturbed is the force of retraction of the coagulum. The type of metrorrhagia and the quality of the blood in extra-uterine pregnancy can depend on the extent of the disturbances of the coagulability. The ovarian dysfunction during the menopausal period is the direct cause of variations of the coagulability of the blood and especially of the delay of the reaction of the retractility of the clotted blood and of the degree of the force of its retractility. The curettage, as far as the surgical procedure permits checking for a time the hemorrhage due to ovarian dysfunction, especially during the climacteric period, effects attenuation and even the disappearance of the fluctuations of the reactions of the coagulability of the blood. In inflammatory lesions of the genital organs, the coagulability of the blood indicates a retardation of the reaction of coagulability and of coagulation, a notable retardation of the reaction of retractility of the coagulated blood and a normal or slightly diminished force of retraction of the clot. In the acute and grave cases as well as in the morbid states complicated by profuse metrorrhagia, the alterations of the coagulability are severe. The coagulability is irregular in adenomyomas of the uterus. In uterine myomas with signs of hyperactivity of the thyroid, the deviations are more pronounced than in the benign myomas of this organ. In ovarian cysts the coagulability of the blood is normal. In cancers of the uterus the coagulability of the blood shows a discord between the reaction of the coagulation and that of retractility of the clotted blood as well as between the reaction of retractility and the force of retraction of the clot; the latter is augmented. A characteristic aspect of these morbid states is the normal degree of coagulation beside the much changed value of the reaction of the retractility of the clotted blood and of the force of retraction of the coagulum and vice versa. The peculiar types of coagulability of the blood observed in various morbid states of the genital organs and of pregnancy undergo changes when, apart from the gynecologic disease or the pregnancy, the patient shows still another disorder, and especially a disease of the liver.

Schweizerische medizinische Wochenschrift, Basel

69: 593-616 (July 1) 1939. Partial Index

*Pathogenesis of Intralaryngotracheal Goiter. C. Wegelin.—p. 593.
Rare Complications of Tonsillectomy. L. Rüedi.—p. 595.
Progress in Treatment of Patients With Diabetes Mellitus. V. Jonáš.—p. 598.
Rare Case of Erythromelalgia. K. S. Saracoglu.—p. 607.

Pathogenesis of Intralaryngotracheal Goiter.—Wegelin was able to connect the theories of von Bruns and Paltauf, for he observed that intralaryngotracheal goiter occurs in fetuses and newborn infants and that even at this stage there exists a connection between the external and internal portion of the thyroid. He found that the bridge of tissue is between the cricoid cartilage and the first tracheal cartilage and that it infiltrates the cricotracheal membrane. Moreover, he was able to observe a preliminary stage of the intralaryngotracheal goiter; in a newborn child and in a child aged 5 years he detected thyroid tissue in the submucosa of the trachea and in the cricotracheal membrane, although these sites showed no macroscopic swelling. In these cases the external thyroid was greatly enlarged. On the basis of these observations the author assumes that in case of goitrous hyperplasia the thyroid may grow into the larynx and trachea during the fetal period but that a later invasion is likewise possible. In studies on goiter in white rats the author was able to make observations which corroborate Paltauf's opinion. The animals received only cooked foods (oats and maize gruel) and some bread. They developed either diffuse or nodular goiters and the author observed that an intralaryngotracheal goiter develops when the enlarged thyroid penetrates between the cricoid and tracheal cartilages and spreads under the mucosa. All stages of invasion could be demonstrated. Since such changes are absent in normal thyroids, their presence seems to indicate that in human subjects also intralaryngotracheal goiter is caused chiefly by the goitrous proliferation of the thyroid, during either fetal or extra-uterine life.

69: 637-656 (July 15) 1939

*Percutaneous Osteodesis in Diaphysial Fractures of Leg. J. Creyssel and L. Roulet.—p. 637.
Malaria and Surgery. E. Melchior and A. Özkan.—p. 640.
Experimental Investigations on Action of Glutathione and of B Vitamins in Infections. J. von Deschwanden.—p. 642.
Meaning of Word Glaucoma in Ancient Greece. F. Rintelen.—p. 646.
Diabetes Insipidus: Case. W. Hirsch and A. Kaatz.—p. 647.
Studies on Enzymatic Cleavability of O-Acetylaneurin and Influence of Aneurin on Choline Esterase. H. Süllmann and H. Birkhäuser.—p. 648.

Percutaneous Osteodesis.—Creyssel and Roulet define as percutaneous osteodesis a method for the immobilization of non-surgically reduced fractures in which two parallel wires (Kirschner) are introduced through the skin and passed through the bony parts vertically to the fracture surface. Evaluating the advantages of this method, the authors stress that the material used to effect the synthesis is easily applied and easily removed. Moreover, the method is comparatively harmless; the simple perforation of the skin and bone reduces the danger of infection. If the technic is faultless, there is almost no danger of an injury to vessels and nerves. The value of the method is proved also by the results; it effects an excellent immobilization, the prosthesis material is well tolerated, there is no retardation of consolidation and the functional results are good. In view of the results which have been obtained with this method in the past, the authors think that it is indicated among others in spiral fractures. All fractures of this type, even those with no immediate dislocation, should be treated with this method, except when there are contraindications of a general or local nature. In obliquely bent fractures the described procedure should be used if a good reposition can be obtained; however, in this case the wires must be left in place for a comparatively long time. In other types of fractures (double fractures, splintered fractures), this procedure is more difficult and indications for it cannot be systematized. In old fractures which had been inadequately reduced and in which a surgical intervention is necessary, osteodesis can be done in the presence of the opened fracture and with removal of the interposed fibrous tissue. In these cases it can be chosen among other methods of osteosynthesis, over which it has the advantage that it is simple and that the prosthesis material is easily removed.

Archivio per le Scienze Mediche, Turin

67: 493-700 (June) 1939. Partial Index

Pathogenesis of Stenosis of Conus Arteriosus of Heart. G. Mottura.—p. 493.
*Hepatorenal Syndrome. E. Zilocchi and A. Marini.—p. 607.

Hepatorenal Syndrome.—Zilocchi and Marini point out the importance and clinical significance of the renal lesions which may complicate operations on the biliary tract (the so-called hepatorenal syndrome). They describe the clinical picture and pathologic anatomy of the syndrome and report results of experiments which were carried on in normal dogs and which aimed to produce the syndrome. The animals spontaneously died within one and four months from the beginning of the experiment. The authors found that the syndrome can be experimentally induced from cholemia (ligation of the common bile duct) as well as from complete external derivation of bile (for a long time). Both procedures have a harmful effect primarily on the liver and secondarily on the kidney. The lesions of the liver are the first to develop. They consist of parenchymal degeneration which evolves to necrosis. Early during the development of degeneration the detoxicating functions of the liver are arrested and toxins are produced in the general and local circulation. A compensatory detoxicating hyperfunction of the kidney takes place, which is followed by development and evolution of renal functional and parenchymal changes of the same type as those which previously developed in the liver and also by development of the syndrome. According to the author the syndrome is caused by various toxins of synergetic action. The similarity of the hepatorenal symptoms to those which are observed in certain toxic conditions (such as burns and eclampsia in pregnancy) and the frequency of the syndrome in various experimental toxic conditions (autolysis of the liver, ligation of the common bile duct, intravenous, intramuscular or intraperitoneal injections of bile and total derivation of the bile) point to the toxic origin of the syndrome, which evolves with acute toxic clinical symptoms and ends with a terminal stage similar to that of uremic coma. The author calls attention to the fact that the results of his experiments do not conflict with proper indications of external derivation of bile in jaundice from obstruction of the bile ducts. Functional disturbances of the liver and kidney developed late in the course of the experiments, namely after more than a month of external derivation of bile, a duration which is never reached in the clinical application of external derivation of bile.

Bullettino delle Scienze Mediche, Bologna

111: 149-232 (May-June) 1939. Partial Index

Intrahepatic Diffuse Calculosis: Pathogenesis. G. Dagnini.—p. 166.
*Ischemic Contracture of Volkmann's Type in Hemophilia. M. Paltrinieri.—p. 203.
Diffuse Neurofibromatosis (Recklinghausen's Disease). F. Cavazza.—p. 214.

Ischemic Contracture in Hemophilia.—Paltrinieri observed two cases of typical ischemic contracture of the hand in hemophilic patients. A mild trauma caused the formation of a large subfascial hematoma at the flexor region of the elbow and caused establishment of the contracture. Neither fracture nor external pressure existed in any of the cases. According to the author, his cases are rare but not unique. He believes that hematoma of the flexor region of the elbow or of the forearm is the main cause of ischemic contracture of the hand, either as a complication of fractures or when it follows a simple trauma. In either case the hematoma infiltrates the interstitial spaces around the local muscles, compresses the local nerves and blood vessels and causes ischemia and neuritis with consequent myopathy and the establishment of the contracture. The evolution of the condition depends on the acuteness of the nervous compression. The role of hematoma in the development of ischemic contracture of the hand is proved by (1) the possible identification of hematoma on microscopic preparations of tissues taken during operations in cases of ischemic contracture, (2) the presence of hematoma in all cases of supracondylar fractures (which may be complicated by ischemic contracture) and its absence in open fractures (which are never complicated by ischemic contracture) and (3) the cessation of the development of ischemic contracture when a large hematoma of the elbow region or of the forearm is drained early in the development of the contracture. The author therefore concludes that: 1. For the prevention of ischemic contracture (as a complication of fractures) it is advisable to reduce the fracture by transolecranic traction with wire. The arm is left in an upward position in order to favor defluxion of hematoma. 2. Early in the development of ischemic contracture without fracture or external compression it is advisable to ascertain the possible presence of ecchymosis and of hematoma of hemophilic origin.

Giornale di Clinica Medica, Parma

20: 819-896 (June 30) 1939. Partial Index

*Indications of Surgical Intervention in Abscess of Lung. R. Paolucci.—p. 819.
Reduced Glutathione in Blood in Hyperthermia from Short Waves. G. Zuddas.—p. 825.
Erythema Nodosum of Tuberculous Origin: Case. T. Moruzzi.—p. 864.

Indications of Surgery in Pulmonary Abscess.—Paolucci observed 200 cases of pulmonary abscess, located in the right lung in 140 cases and in the left one in sixty. The diagnosis of abscess of the lung is made by x-ray examination of the lung immediately after appearance of the first typical sputum. Treatment, whether surgical or symptomatic, is determined by the evolution of the disease as shown by a second roentgenogram taken two weeks after the first one. Increase in the size and darkness of the image of the abscess in the second roentgenogram points to evolution of the disease and the advisability of an operation. Treatment of simple cortical abscess with pleural adhesions consists in paraffin plugging, which is followed ten days later by pneumonotomy and introduction, in the incision, of sterile gauze soaked in a barium sulfate solution. Ample pneumonotomy and ample drainage are indicated in putrid abscess. Massive gangrene of the lung as a rule is bilateral and refractory to treatment. In rare cases an ample pneumonotomy may be followed by elimination of large amounts of necrotic tissues and eventual recovery of the patient. The treatment of chronic suppuration consists in progressive resection of the involved pulmonary tissues and in favorable cases by resection with the electrical bistoury. Bronchiectasis, alone or in association with pulmonary tuberculosis, calls for a lobectomy. Abscesses of the lung are multiple in a large number of cases. When they are remotely located in different lobes of the lung they are separately opened and drained. If they are close to each other they are opened through a thoracic wound, which may be large or small according to the resistance of the patient. If the wound is large the abscesses are depleted directly through the wound; otherwise one abscess is opened directly through the wound and the others are evacuated through the one which was previously depleted. A drain is left in either case. Artificial pneumothorax is never resorted to as a means for inducing collapse in the presence of abscess of the lung. Paraffin treatment can be resorted to in certain forms of pulmonary suppuration, either early as a preliminary procedure to pneumonotomy or as a complementary operation with the aim of filling large cavities, which are left in certain cases from destruction of large areas of the lung.

Giornale Ital. di Dermatologia e Sifilologia, Milan

80: 427-630 (June) 1939. Partial Index

Influence of Nicotinic Acid on Coproporphyrinuria from Neoarsphenamine. E. Scolari.—p. 545.
*Effects of Vitamin C on So-Called Postgonorrheal Urethritis. G. B. Cottini and M. Muscolino.—p. 563.

Ascorbic Acid in Postgonorrheal Urethritis.—According to Cottini and Muscolino the so-called postgonorrheal urethritis is primarily a local C hypovitaminosis and secondarily a local reaction of the urethra from postgonorrheal pathologic alterations of the epithelium and mucosa of the urethra. The diagnosis of urethritis with epithelial and mucosal changes is made from the appearance of the urethral secretion during microscopic examination, as it is rich in epithelial cells and does not contain pus cells and bacteria (or else it contains but few). In some cases postgonorrheal urethritis is due to extra-urethral infection or else to prostatitis or seminal vesiculitis. The authors report satisfactory results from the administration of intravenous injections of ascorbic acid in thirteen patients who were suffering from the condition. In all cases the urethral secretion was free from gonococci and the local and general treatments (which are generally resorted to in the condition) had failed. The injections were given to the patients every other day, in doses of 5 cc. of a solution containing 0.5 Gm. of ascorbic acid (equal to 1,000 international

units) for each injection, in a series of ten injections for each treatment. The treatment was repeated after twenty or twenty-five days of rest during which time the patients had no other treatment. The general condition of all patients improved. In the majority of cases the secretion rapidly diminished up to complete disappearance with recovery and persisted after reestablishment of sexual functions and up to the present time (more than a year after discontinuation of the treatment). In three cases of postgonorrheal urethritis in the presence of intestinal infection, prostatitis or seminal vesiculitis (one case of each) the treatment failed. The authors conclude that the treatment is of value in controlling postgonorrheal urethritis from epithelial and mucosal alterations and also in differentiating the forms of postgonorrheal urethritis which originate in extra-urethral infection or extra-urethral inflammation and which require proper treatment. The ascorbic acid treatment is simple, harmless and well tolerated. The authors' article is a preliminary report.

Fortschritte der Therapie, Leipzig

15: 309-372 (June) 1939. Partial Index

Significance of Sugar in Nutritional Therapy. K. Beckmann.—p. 309.
Venous Disorders, Their Sequels and Their Treatment. C. Dienst.—p. 326.
*Treatment of Postdiphtheric Paralysis with Vitamin B1. P. Feige.—p. 333.
Use of Homogenous Serum in Treatment of Chronic Diseases. H. Boehnhardt.—p. 340.

Vitamin B_1 in Postdiphtheric Paralysis. — Reviewing 1,590 cases of diphtheria which were observed during the years 1936 and 1937, Feige found 100 cases in which postdiphtheric paralysis developed. Paresis of the soft palate was observed in ninety cases, paresis of the ocular muscles in twenty cases, paralytic symptoms of the legs in twenty-three cases, paralysis of the pharyngeal muscles in eighteen cases, paralysis of the respiratory musculature in four cases, paralysis of the musculature of the neck and back in three cases and paralysis of the diaphragm only once. Some of the children had more than one form of paralytic symptoms and in eighteen of the children the paralysis threatened life. Of the sixty cases in which the entire course of the postdiphtheric paralysis could be observed, thirty were treated with a preparation of vitamin B_1 and thirty either received no treatment for the paralytic symptoms or were treated with other medicaments. A comparison of these two groups of cases revealed that in those patients who were treated with vitamin B_1 the paralytic symptoms persisted on the average for 29.6 days, whereas in the other group they persisted on the average for forty-nine days. The author administered the vitamin B_1 by mouth and by intramuscular injection on alternate days. One day the children were given three times one tablet containing 1 mg. of the vitamin, that is, three times 400 pigeon units; on the following day they were given an intramuscular injection of 1 cc. of a vitamin B_1 preparation which contained 4,000 pigeon units. In remarks on the problem of the pathogenesis of postdiphtheric paralysis, the author cites observations of several investigators and suggests that these postdiphtheric paralytic symptoms are the result of the concurrence of a toxic impairment of the tissues with a lack of the B_1 substance, which has a ferment-like action. He thinks that this explains at the same time the success of the treatment with vitamin B_1.

Klinische Wochenschrift, Berlin

18: 837-868 (June 17) 1939. Partial Index

Further Clinical Experiences on 240 Diabetic Patients With New Type of Native Insulin Depot. F. Umber, F. K. Störring and G. Engelmann.—p. 837.
*Intravital Studies on Bone Marrow in Acidosic Osteopathy. N. Markoff.—p. 839.
Results of Comparative Determinations of Ascorbic Acid in Blood and Urine. Falke.—p. 842.
Investigations on Elimination of Urinary Pigments in Diabetes Insipidus. G. Kabelitz.—p. 849.
Investigations on Vitamin B_1 Metabolism. G. Guhr.—p. 854.
Clinical Investigation on Action of Hormone of Adrenal Cortex on Fat Tolerance Curve in Addison's Disease. E. Westerlund.—p. 856.

Bone Marrow in Acidosic Osteopathy. — Markoff fed adult male rabbits for twenty-five days with cane sugar and water and during a second period of experimentation he fed the animals with cane sugar and turnips. Periodically the animals were subjected to blood tests, puncture of the tibia and x-ray examination of the bones; later, microscopic studies were made on the bone marrow and the bones. He found that a diet which induces acidosis produces a hypertrophy of the bone marrow followed by a porotic process in the bones. Katase asserted that this osteoporotic process is of acidotic origin, but the author thinks that the coupling of medullary and osseous changes is so apparent that it indicates another pathogenesis of the osseous disorder. He observed similar conditions as those which Naegeli assumed for osteomalacia. The secondarily appearing bone changes represent, so to speak, a symptom of the primary process of medullary hyperplasia; that is, the osteoporosis is of myelogenic origin and the author designates it as myelogenic osteopathy. To the hyperplastic bone marrow there corresponds an increase in osteoclasts and, as the author had pointed out earlier, the fibrous condition of the marrow is usually accompanied by an increase in osteoblasts and osteosclerosis. Thus there exist typical relations between the condition of the marrow and the bone. This relationship can be expressed as follows: In the presence of cellular marrow there exists increased activity of the osteoclasts and osteoporosis; in the presence of fibrous marrow, increased activity of the osteoblasts and osteosclerosis. These two reactions are frequently only two phases of a marrow-bone reaction in which the development of fibrous marrow is preceded by a medullary hyperplasia. This can be estimated only by intravital studies on the bone marrow. An especially striking example is polycythemia vera, in which at the beginning a hyperplastic marrow corresponds to an osteoporosis, whereas in the later stages fibrous marrow with osteosclerosis is observable.

Medizinische Klinik, Berlin

35: 869-904 (June 30) 1939. Partial Index

Psychoses in Internal Diseases. Klimke.—p. 869.
Multiple Sclerosis: II. G. Voss.—p. 870.
Larval Myxedema. O. Merkelbach.—p. 872.
*Nonsuppurative Thyroiditis. K.-H. Riwoldt.—p. 875.

Nonsuppurative Thyroiditis.—Riwoldt reports two cases of pure thyroiditis with no pyogenic evolution. Of neither patient (a man aged 40 and a woman aged 62) did personal and familial anamnesis indicate endocrine disorders; however, the inflammation of the thyroid was preceded by an infection (tonsillitis and an ulcerated tooth in the former, influenza in the latter patient). Therapy consisted in physical and lingual rest, ice compresses, liquid diet and proprietary medicaments for the former patient, with rest and iodide inunctions for the latter. Both patients recovered completely after a short period of convalescence without sequelae six months after or indications of exophthalmic goiter and myxedema. In the course of his epicritical remarks, based largely on the literature of the subject, the author ascribes the infrequency of pure thyroiditis in part to the omission of requisite diagnosis. He advises against cuneiform excision and favors a conservative symptomatic therapy. Etiologically it is impossible at present to determine whether bacteria or their toxins are at fault. He thinks, however, that temporary disturbances of the endocrine functions of the thyroid may be the causative factor, but without sufficient intensity to induce myxedema.

Münchener medizinische Wochenschrift, Munich

86: 1027-1064 (July 7) 1939. Partial Index

Exudative Eczematoid with Special Consideration of Food Allergy. H. T. Schreus.—p. 1027.
Clinical Aspects of Drowning. C. J. Mijalieff.—p. 1031.
*Clinical Relations Between Pleurisy and Genital Tuberculosis in Women. H. Winkler and E. Wegemer.—p. 1036.
Lecithin Treatment of Multiple Sclerosis. I. Minea.—p. 1038.
Labor Pains and Respiration. W. Müller.—p. 1042.

Pleurisy and Genital Tuberculosis.—Winkler and Wegemer say that studies on exudates by means of the culture method and the inoculation of animals have demonstrated that a large number of cases of pleurisy, particularly those of the wet type, are of a tuberculous nature. Then they review statistics on the comparatively high incidence of pulmonary tuberculosis after pleurisy, but they also show that the literature contains few reports about connections between pleurisy and extrapulmonary tuberculosis. Their own investigations on a possible relationship between pleurisy and genital tuberculosis in women were brought about by the observation that a large percentage of

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women with genital tuberculosis previously had had pleurisy. Of sixty women with genital tuberculosis who were observed in a sanatorium for tuberculous patients, twenty-five (41 per cent) stated that they had had pleurisy and the authors show that the tuberculous etiology of these pleuritic processes cannot be doubted. Reviewing the material of a woman's clinic, the authors detected thirty-five cases in which the diagnosis of genital tuberculosis had been verified by surgery and in twelve (34.2 per cent) of these women the previous history disclosed a pleuritic or pneumonic process. Only three of the ninety-five women with genital tuberculosis had active tuberculous processes in the lungs. The majority of the patients developed tuberculous adnexitis within five years after the pleurisy. In view of the obscure genesis of many disorders of the genital adnexa, the authors suggest that a previous pleurisy be searched for. If the anamnesis of patients with lesion of the genital adnexa reveals a pleurisy, particularly the wet form, a tuberculous etiology should be taken into consideration.

Zeitschrift für klinische Medizin, Berlin

136: 311-438 (June 12) 1939. Partial Index

Hepatic Function in New Malaria and Some Clinical Remarks. H. Ruge.—p. 311.
Clinical Significance of Enterogenic Osteopathies. N. Markoff.—p. 334.
*Angina Pectoris, Adrenals and Iodine Content of Blood. W. Raab and E. Schönbrunner.—p. 354.
Attacks of Fever, Hypertension and Tachycardia After Concussion of Brain. W. Raab.—p. 362.
Influence of Short Exertions and Continuous Exertions on Metabolism. F. Chrometzka and K. H. Witten.—p. 378.
Investigations on Working Capacity and Prognosis of Patients with Diabetes Mellitus. D. F. von Hodenberg.—p. 399.
Intestinal Disturbances in Poliomyelitis. F. Kuhlmann and H. Otto.—p. 430.

Angina Pectoris, Adrenals and Iodine Content of Blood.—Raab and Schönbrunner cite observations which indicate that increases in the iodine content of the blood, with certain restrictions, can serve as a criterion of acute secretions of epinephrine. It was their object to investigate whether in patients with simple angina pectoris the secretion of epinephrine is absolutely increased or whether, as seemed more probable, there exists only an increased reactivity of the heart muscle (impaired by coronary sclerosis) to physiologic quantities of epinephrine. They observed augmentations in the total iodine content of the blood of healthy persons following the intravenous injection of epinephrine, after the patients had been exposed to low temperatures and after muscular exertion. These reactions of the iodine content of the blood to epinephrine and exertion could be weakened or completely abolished by ergotamine tartrate. The behavior of the iodine content of the blood of patients with simple angina pectoris did not deviate from that of healthy subjects during rest or after muscular exertion. Following the irradiation of the adrenals of patients with angina pectoris, the reaction of the iodine content of the blood to the exertion of work was either weakened or reversed. The authors regard these observations and reports in the literature as further arguments in favor of the assumption that elimination of epinephrine, which as such is physiologic, plays an essential part in the development of stenocardiac symptoms of patients with coronary sclerosis during work, excitement and exposure to cold.

Zeitschrift für Urologie, Leipzig

33: 337-408 (No. 6) 1939. Partial Index

Renal Injuries Produced with Dull Force and Their Sequels. H. Domrich.—p. 337.
*Method of Operation in Pelvic Kidney. R. Chwalla.—p. 381.
Significance of Vessels at Lower Renal Pole. H. A. Dege.—p. 385.
Case of Bilateral Pyelohydronephrosis and Bending of Ureter. K. Hutter.—p. 391.
Ureteral Prolapse and Congenital Diverticulum of Calix of Kidney. T. Ishikawa and H. Tanio.—p. 395.

Operation in Pelvic Kidney.—Chwalla shows that as yet there is no agreement about the best surgical method in case of pelvic kidney (pelvic renal dystopy). He thinks that the selection of the method of approach is dependent chiefly on the position of the pelvic kidney. In view of the importance of the exact localization of the organ, the author thinks that the term pelvic kidney should be replaced by designations which indicate the exact position, such as dystopia sacralis, dystopia lumbosacralis, dystopia sacroiliaca and dystopia iliaca. Another factor, which is decisive in the selection of the operative method, is whether the pelvic kidney is infected or not. In this connection he points out that in case of infection the surgeon will hesitate to employ the transperitoneal approach. Depending on the position of the pelvic kidney, the method of approach is more median or lateral, higher or lower. Other factors that must be taken into account are adiposity of the patient, size of the pelvic kidney, infection, adhesions and so on; that is, individualization is essential. The author describes a case in which the usual lumbo-abdominal transverse incision was made. From this incision the abdominal cavity was opened in order to obtain a survey over the renal recess and to ascertain the possible existence of a supernumerary kidney. On the other hand, extraperitonization of the pelvic kidney with reduction of the peritoneal sac was done in spite of aseptic conditions in the kidney, so as to insure a normal postoperative course and discharge of the wound secretion through the incision in the soft parts. In the discussion of the case, the author points out that inspection of the renal region seemed advisable because supernumerary organs have been known to occur in unilateral pelvic kidney. On the other hand, many pelvic kidneys cause no clinical manifestations and the menstrual disturbances found a gynecologic explanation. However, these menstrual disturbances as well as the pains were completely counteracted only following the removal of the pelvic kidney, which at first had been regarded as a tumor. A survey of the literature revealed to the author that pelvic kidney is frequently mistaken for a tumor of the adnexa or of the uterus. He thinks that, aside from the menstrual disturbances, this is probably the reason why operations for pelvic kidney are more frequent in women than in men.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 3173-3296 (June 24) 1939. Partial Index

Diencephalic Epilepsy. L. van der Horst.—p. 3183.
Results of Metrazol Treatment in Fifty Cases of Schizophrenia. A. Hutter.—p. 3188.
Supravital Technic and Its Applicability in Hematologic Diagnosis. S. I. de Vries.—p. 3207.
*Postoperative Gastric Retention an Example of Functional Pathology in Surgery. C. van Gelderen.—p. 3215.
Further Report Regarding Connection Between Schizophrenia (and Related Disorders) and Month of Birth. W. J. J. de Sauvage Nolting.—p. 3219.

Postoperative Gastric Retention.—According to van Gelderen, postoperative retention of the gastric contents is a frequent complication of gastric surgery. Irrespective of the type of operation it develops chiefly in male patients who have undergone surgical treatment for peptic ulcer. The author cites statistical reports which indicate that, whereas in women the incidence of postoperative gastric retention varies between 4.6 and 6.4 per cent, in men the incidence is around 20 per cent. The author also observed a greater incidence during the spring months. He shows that this dyskinetic, chiefly spastic, disturbance of the gastric passage may be classed with visceral spasmophilia in patients with sympathetic dysharmony who develop gastric ulcer. It is hardly ever possible to establish a definite anatomic cause of the postoperative retention of the gastric contents, and the author shows that this postoperative retention is a typical example of a disturbance of function without anatomic cause. He emphasizes that this disorder does not provide an indication for a new operation but that he, in collaboration with Borst, developed a chemical treatment for the patients with this functional neuromuscular disturbance. (Borst, in his paper in *Acta medica Scandinavica* 97:68 [Oct. 29] 1938, abstracted in THE JOURNAL, Jan. 7, 1939, page 94, recommends a solution of dextrose subcutaneously or cane sugar with a few drops of orange juice by mouth.)

Acta Chirurgica Scandinavica, Stockholm

83: 455-548 (June 26) 1939. Partial Index

*Radical Resection in Gastric and Duodenal Ulcer. E. Landelius.—p. 461.
Comments on Complications Occasioned by Rustless Surgical Nail. O. Raagaard.—p. 475.
*Use of Heparin in Arterial Embolism: Experimental Investigations on Bleeding During Arteriotomy and Action of Heparin. T. Olovson.—p. 487.
Injuries of Articular Meniscuses. L. Efskind.—p. 499.
Meckel's Diverticulum Perforated by Foreign Body. T. Persson.—p. 530.

Radical Resection in Gastric and Duodenal Ulcer.—Landelius reports studies on the early results of operations for gastric ulcer which were performed at his hospital during the decade from 1928 to 1937. Of 638 operations for gastric

and duodenal ulcers, 110 were made on perforated ulcers and 528 were performed during the free intervals. In thirty cases in which Billroth's first method was employed the mortality was 6.6 per cent; in sixteen cases of Billroth II retrocolica oralis inferior it was 6.2 per cent; in 415 cases of Billroth II retrocolica oralis in the manner of Polya-Reichel it was 3.8 per cent; in twenty-five cases of palliative resection according to Finsterer it was 24 per cent; in twenty-four cases of gastro-enterostomy it was 16.6 per cent; in eighteen cases of resection of peptic ulcer after gastro-enterostomy it was 11 per cent, and in the 110 cases in which the intervention was for perforating ulcer the mortality was 14.5 per cent. Among the patients in whom palliative resection was done, complications developed for which the surgical method could be blamed, such as perforation of the ulcer, leakage of the duodenal stump and acute hemorrhagic impairment of the pancreas. In none of the cases of Billroth II oralis was there leakage of the duodenal stump. All suturing of the intestine was carried out with two continuous tiers of catgut and infolding according to Lembert and without suturing of the mucous membrane. Resection of the stomach was done fairly extensively in order to obtain achlorhydria or considerable hypochlorhydria. Care was taken that the patients had a plentiful supply of fluid before and after operation. After recovery no dietetic therapy was employed. Persistent and severe changes in the wall as evidenced by x-ray examination (niche or deformity of the bulbus) in conjunction with anamnestic data were regarded as indications for an operation during the interval. The author cites figures which indicate that the mortality increases greatly with the age of the patients; moreover, the incidence of perforation is high among the patients of advanced age. On these grounds he deems it justifiable to advise operation in younger years and at an earlier stage of the disease.

Heparin in Arterial Embolism.—Olovson stresses the importance of early heparinization in cases of arterial embolism. He shows that treatment with heparin is most important before the operation or before the onset of the conservative treatment, the main object being to prevent thrombosis in the portion of the artery which is peripheral to the embolus, and in the collateral tracts. To be sure, heparin should be given also after the operation and during the conservative treatment, until the danger of secondary thrombosis has passed. Regarding the dosage of heparin, the author says that 1 mg. per kilogram of body weight prolongs the coagulation time to forty-five minutes. In his own arteriotomies on dogs he administered a single large dose; that is, 5 mg. per kilogram of body weight. He began the operation about ten minutes after the intravenous injection of this dose of heparin. As suture material he employed silk which had been saturated with heparin. Observations on bleeding in dogs and rabbits in the case of wounds and of arteriotomy under the influence of heparin revealed to the author that the administration of heparin caused the bleeding to last longer and to be more intense; however, no after-bleeding occurred and no hematoma was formed; a local hemostyptic proved to have a good effect; in no case of arteriotomy did secondary thrombosis occur.

Acta Radiologica, Stockholm

20: 213-323 (June 20) 1939. Partial Index

The "Cut-Off" of the Diaphragm Line: A New Diagnostic Symptom in Chest Radiography. F. Polgár.—p. 219.
Diverticulum Pericardii. L. Haas.—p. 228.
Roentgenograms of Perforating Diverticula of Colon. A. Renander.—p. 235.
Roentgenologic Diagnosis of Perisigmoiditic Infiltrates. T. Krogdahl.—p. 241.
Covered Perforations in Cancer of Colon. A. Renander.—p. 257.
*Allergic Reactions During Injection of Contrast Medium for Urography. K. A. Hultborn.—p. 263.
Roentgenogram of Tuberculosis of Prostate. B. Stenström.—p. 303.

Allergic Reactions by Urographic Contrast Medium.—Hultborn gives an account of seven cases in which complications developed following the injection of urographic contrast medium. The symptoms were interpreted as allergic reactions elicited by the contrast medium. Three of the patients had only urticaria and temporary edema but the other four, shortly after the injection, had severe symptoms of shock, which in one were combined with urticarial erythema. Anamnestic inquiries revealed that four of the patients had a previous history of allergic symptoms in the form of asthma or urticaria. One of the patients with the shock reaction, a woman aged 56 who had a normal nitrogen, did not eliminate the contrast medium but showed bilateral "filling" which was interpreted as secondary to the shock. About thirty-six hours later the woman presented symptoms of uremia, which disappeared after one week. It is assumed that the uremia was likewise caused by the shock. On reviewing the literature the author found reports of eight similar cases, one of which had a fatal outcome. He says that these complications have developed after different urographic contrast mediums. He advises that, before a contrast medium is injected for urographic purposes, inquiries should be made regarding the existence of earlier allergic symptoms. In cases in which there is a positive history in this respect, caution is necessary with intravenous urography. If complications arise, it is advisable to administer calcium preparations intravenously and epinephrine subcutaneously. In case of shock, analeptics should be given and, if the shock is severe, a permanent intravenous drip should be resorted to.

Nordisk Medicin, Helsingfors

2: 1963-2050 (June 30) 1939. Partial Index

Doping: Review of Application of Medicaments and Like for Improvement of Performance in Sports. O. Bøje.—p. 1963.
*Pathogenesis of Bundle-Branch Block Illuminated by Electrocardiographic Changes in Precordial Leads: Remarks on Relation Between Bundle-Branch Block and Other Preponderance Curves in Precordial Leads and Their Relation to Infarction Curves. V. Mortensen.—p. 1971.
*Two Cases of Inhibition of Bone Marrow Due to Splenomegaly. J. Schousboe.—p. 1980.

Pathogenesis of Bundle-Branch Block.—Mortensen describes the electrocardiographic changes in sixteen cases of bundle-branch block. He finds much conformity between the changes in lead 4F in left bundle-branch block and in lead CF_5 in bundle-branch block of different Bayley types, indicating that Bayley's types represent complete right bundle-branch block. The R wave is reduced or absent in CF_5 in left bundle-branch block. A similar change is found in marked left preponderance. The hypothesis is presented that the normal size of the R wave in CF_5 and 4F depends on a certain normal relation between the conduction through the two ventricles and that the diminished R wave which may appear in marked left preponderance and in more pronounced degree in left bundle-branch block depends on a relative delay in the conduction through the left ventricle, either because of changes in the conduction system or because of hypertrophy of the left ventricle. From the even transition between left bundle-branch block, new terminology, and marked left preponderance it seems likely that marked left preponderance is due to a lesser degree of delay in the conduction through the left ventricle, and such delay is in most cases explainable by hypertrophy of the left ventricle. The author says that the new terminology for bundle-branch block brings the various theories of the cause of left preponderance into a more probable connection with one another. The view that delay in conduction is the direct cause of left preponderance also explains the cases of marked left preponderance without hypertrophy of the left ventricle. He stresses that he does not in this article refer to the form of "sinistrocardiogram" (usually with negative T_1) which is due to a horizontal position of the heart. Attention is called to the fundamental difference between the absence of the initial positive deflection in CF_5 in bundle-branch block, or pronounced left preponderance, and in anterior wall infarction; in the first there is a diminution of the R wave, eventually a complete absence, in the last an initial negative deflection (a Q wave) simultaneously with complete or partial disappearance of the R wave. An eventual remnant of the R wave in left bundle-branch block will thus manifest itself as a slight initial positive deflection, in anterior infarction as a splitting in an initial negative deflection.

Inhibition of Bone Marrow Due to Splenomegaly.—Schousboe says that his cases of lymphogranulomatosis and Banti's disease showed splenogenic inhibition of transmission of cells from the bone marrow similar to that described in cases of tuberculous splenomegaly. The proliferation of the reticulo-endothelial elements in the spleen is assumed to cause characteristic relations of the blood and bone marrow, mainly anemia, thrombopenia, leukopenia, hyperplasia of the bone marrow and shifting to the left, which after splenectomy are replaced by normal hematologic relations.